

The Art of Drawing Engraving Etching  
Limning Painting Walling and Colouring



London Printed for R. Bachel Jones 1672. By Philip Hebrae fclp

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*Will. Inglethorpe del. & sculp.*

POLYGRAPHICE;  
OR  
The Art of Drawing, Engrav-  
ing, Etching, Limning, Paint-  
ing, Washing, Varnishing,  
Colouring and Dying.  
IN THREE BOOKS.

- I. Shews the Drawing of Men, and o-  
ther Animal Creatures, Landscips, Countries,  
and Figures of Various Forms.
- II. The Way of Engraving, Etching and Limn-  
ing, with all their Requisits and Ornaments.
- III. The way of Painting, Washing, Varnish-  
ing, Colouring, and Dying, according to the  
Method of the best Authors now Extant.  
Exemplified in the Painting of the Antients,  
Washing of Maps, Globes, or Pictures; Dy-  
ing of Cloth, Silks, Bones, Wood, Glass,  
Stones, and Metals: together with the way  
of Varnishing thereof according to any Par-  
pole or Intent. *The Like may yet be said.*

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By W. S. a Lover of Art.

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L O N D O N,

Printed by E. T. and R. H. for Richard James  
at the Golden Lion in Little-Britain. 1672.



Imprimatur *Sam. Parker* R.  
in Christo Patri ac Dn°. *Dn°. Gilberto* Archiep.  
Cantuar. è sac. Domest.  
September 11<sup>th</sup>. 1671.



*To the Honourable and truly  
Noble PETER STANLEY  
of Alderly, in the County of  
CHESTER, Esquire.*

SIR,

**A**S Nature was never more earnest nor solicitous to conserve her various Species; nor a tender Mother more careful of the hopeful fruit of her Womb, than you have been indulgent to the Muses; not only to universal Learning in general, and to *Urania* herself in particular; but also an especial Favorite, to as many as have had but the face of Ingenuity, or the least appearance of boldness to court any of the beauties of the excellent *Mnemosyne*: So I could do no less,

(having

The Epistle Dedicatory.

this opportunity) but humbly present (in token of a thankful mind) this small Product of a few spare hours. The kind acceptance of which, I shall account, as a Wall and Bulwark, against the overflowing Deluge of Ignorance, Scorn, and Envy. Your name, Sir, is enough to make this work go Currant, and to pass unquestionable under the piercing censure of this Critical age. And that as much happiness may attend you as can be conferr'd upon a Mortal is the desire of

Sir,  
Your Humble Servant  
W. Salmon



THE  
P R E F A C E  
TO THE  
R E A D E R.

**T**HE Subject of the ensuing work is the Art of Painting: a name not only too singular; but also too short or narrow, to express what is here intended thereby: For we do not only express that Art, (as it is generally received) but also Drawing, Engraving, Etching, Limning, Washing, Colouring

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## The Preface

louring and Dying ; all which being considered in their proper extent, infinitely exceeds that curtail'd name of Painting ; which that we might joyn all in one proper and comprehensive word, we made choice of that Greek Compound **POLYGRAPHICE**.

To perswade any one to the study or practice of this Art, would be a great folly ; since Ignorance, (which is always blind) can never be able to conceive or judge aright. For to him that already understands it, the labour would be useless and unprofitable ; to him which is already delighted therein, it would be needless and superfluous ; and to the Averse and Ignorant, it would be the putting a jewel into a Swines snout : the exquisite know-  
ledge

to the Reader.

ledg of which, is impossible ever to be attained or understood, by such prejudicate and cloudy Souls, although it is sufficiently known to many already; and its usefulness as apparent as it is excellent: To enumerate the one, or rehearse the other, is but to perswade the world, that it is day light when the Sun is upon the Meridian; or at least to inculcate, an Ignorance of those things, which have been manifestly known even a long time since.

The Method of this work is wholly new, wherein we have united and made one, such various subjects, as have been the uncertain, obscure, and tedious discourse of a great number of various and large Volumes. What shall we say? things far asunder, we have

## The Preface

laid together : *things uncertain*, are here limited and reduced : *things obscure*, we have made plain : *things tedious*, we have made short : *things erroneous*, we have rectified and corrected : *things hard*, we have made facil and easie : *things various*, we have collected : *things (in appearance) heterogeneous*, we have made homogeneous : And in a word, the whole Art we have reduced to certain heads ; brought under a certain method ; limited to practical rules ; and made it perspicuous, even to a very mean understanding.

In the Composure of this work (besides our own Observations) we have made use of the best Authors now Extant, that we could possibly procure, or get into our hands ; wherein our labour was not



to the Reader.

not small ; *what in Reading, Comparing, Transcribing, Choosing, Correcting, Disposing, and Revising every thing, in respect of Matter, Form, and Order. The which had we any President to have followed; any Path to have traced; any Example to have imitated; any Help to have consulted; or any Subject entire: Or otherwise, had the Number of our Authors been small; their Maxims, truths; their Rules, certain; their Meanings not obscure; or their Precepts been reduced to Method and Order: We might not only, with much more ease, pleasure, and certainty; less labour, trouble, and pains; greater perspicuity, plainness, and singularity; better order, method,*

## The Preface to the Reader.

method, and language; but also in shorter time have brought to perfection, what we here present you withall.

Lastly, the Reader is desired to take notice, that in this following work, there are many excellent secrets, not vulgarly known; which fell into our hands from severall special friends (whose exquisite knowledge in these kind of Mysteries doth truly declare them to be absolute Masters thereof) which for the publick good are freely communicated to the World.

Vale

## An Explanation of the Quotations.

[2. 2.] signifies the second Section of the same Chapter:  
[2. 2. 4.] the second Section of the fourth Chapter:  
[3. 4. 5. 6. 7.] the third, fourth, and fifth Sections of the seventh Chapter; the like understand of the rest.

# POLYGRAPHICES

## *Liber Primus.*

### Of Drawing.

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#### CHAP. I.

##### *Of Polygraphice in General.*



POLYGRAPHICE is an Art, so much imitating Nature, as that by proportional lines with answerable

Colours, it teacheth to represent to the life (and that *in plano*) the forms of all corporeal things, with their respective passions.

I I. It is called in general in Greek *εἰκαστική*, in Latine *Pictura*, and in English the *Art of Painting*.

I II. It is sevenfold (to wit) in Draw-

B

ing,

ing, Engraving, Etching, Limning, Painting, Washing and Colouring.

IV. *Drawing* is, that whereby we represent the shape and form of any corporeal substance in rude lines only.

V. It consists in proportion and passion, as it hath relation to motion and situation, in respect of Light and Vision.

VI. *Sanderson* saith, This Admirable Art, is the Imitation of the surface of Nature in Colour and proportion.

1. By Mathematical demonstration  
2. By Chorographical description, 3. By shapes of Living creatures, 4. And by the forms of Vegetables, in all which prefers Likeness to the life, conserves it after death, and this altogether by the sense of seeing.

VII. The *proportion* shews the true length, breadth or bigness of any part (in Known measures) in respect of the whole, and how they bear one to another: The *passion* represents the Visual Quality, in respect of love or hatred  
forro

sorrow or joy, magnanimity or cowardise, majesty or humility, of all which things we shall speak in order.

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## C H A P. II.

*Of the Instruments of Drawing.*

**I.** **T**He Instruments of Drawing are sevenfold, viz. Charcoals, feathers of a Ducks-wing, black and red Lead pensils, pens made of Ravens quils, Rulers, Compasses, and Pastils.

**II.** Charcoals are to be chosen of Sallow-wood split into the form of pensils, and sharpned to a point, being chiefly known by their pith in the middle.

*Their use is to draw lightly the draught over at first, that if any thing be drawn amiss it may be wiped out and amended.*

**III.** The feathers ought to be of a Ducks-wing, (though others may serve well enough) with which you may wipe out any stroke of the Charcoal where it

is drawn amiss, lest variety of Lines breed confusion.

IV. *Black and red Lead pensils*, are to go over your draught the second time more exactly, because this will not wipe out with your hand, when you come to draw it over with the pen.

V. *Pens* made of Ravens quills (but others may serve) are to finish the work: but herein you must be very careful and exact, for what is now done amiss there is no altering of.

VI. The *Rulers* which are of Use, to draw straight or perpendicular lines, triangles, squares or polygons, the which you are to use in the beginning till practice and experience may render them needless.

VII. *Compasses* made of fine Brass with Steel-points, to take in and out, that you may use black or red Lead at pleasure.

Their use is first to measure (by help of a curious scale of equal parts upon the edge of your ruler) your proportions, and whether your work is exact

which

which is done with the Charcoal. Secondly, to draw Circles, Ovals, and Arches withal.

VIII. *Pastils* are made of several Colours to draw withal, upon coloured paper or parchment, Thus,

Take *Plaister of Paris* or *Alabaster* calcined, of the Colour of which you intend to make your *pastils* with ana q. s. grind them first asunder, then together, and with a little water make them into a past, then with your hands roul them into long pieces like black-lead pensils, then dry them moderately in the Air: being dried when you use them, scrape them to a point like an ordinary pensil.

And thus may you make *pastils* of what colour you please, fitting them for the faces of Men or Women, Landscips, Clouds, Sun-beams, Buildings and Shadows.

IX. To the former add good Copies, Patterns, and Examples of good Pictures and other draughts, without which it is almost impossible, that the young Artist should ever attain to

any perfection in this Art.

*We have wholly pretermitted these for brevity sake, but those that desire to be furnished with any excellent Patterns, Copies or Prints may have of all sorts, whether of humane shape, perspective design, Landskip, Fowls, Beasts, Fishes, Insects, Plants, Countries, or any other Artificial figures exquisitely drawn at very reasonable rates, where this book is to be sold; the plenty and easie charge whereof was also another reason for which we were unwilling to insert them here, as also because greater variety may yet be bought in single papers, than possibly we could have inserted, had we been so minded.*

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### C H A P. III.

*Of the precepts of Drawing in General.*

- I. **B**E sure to have all the necessary *re-*  
afore said in readiness, but it w *to*  
be good to practise as much as may b  
wit



without the help of your Rule and Compasses ; it is your eye and fanſie muſt judge without artifiſical meaſurings.

II. Then firſt begin with plain Geometrical figures, as Lines, Angles, Triangles, Quadrangles, Polygons, Arches, Circles, Ovals, Cones, Cylinders and the like. For theſe are the foundations of all other proportions.

III. The *Circle* helps in all orbicular forms, as in the Sun, Moon, &c. the *Oval* in giving a juſt proportion to the face, and mouth ; the mouth of a pot or well, the foot of a Glaſs, &c. the *ſquare* confines the Picture you are to Coppy, &c. the *Tryangle* in the half-face ; the *Polygone* in Ground-plats, Fortifications and the like ; *Angles and Arches* in perſpective ; the *Cone* in Spires-tops of Towers and Steeples ; the *Cylinder* in Columns, Pillars, Pilasters and their Ornaments.

IV. Having made your hand fit and ready in General proportions, then learn to give every object its due ſhade ac-

according to its convexity or concavity, and to elevate or depress the same, as the object appears either nearer or farther off the light, the which is indeed the life of the work.

V. *The second practice of drawing* consists in forming *fruits*, as Apples, Peares, Cherries, Peaches, Grapes, Strawberries, Peascods, &c. with their *leaves*: the imitation of *flowers*, as Roses, Tulips, Carnations, &c. *Herbs*, as Rosemary, Time, Hysop, &c. *Trees*, as the Oak, Fir, Ash, Wallnut, &c.

VI. *The third practice of drawing imitates*, 1. *Beasts*, as the Lamb, Elephant, Lion, Bear, Leopard, Dog, Cat, Buck, Unicorn, Horse, &c. 2. *Fowls*, as the Eagle, Swan, Parrot, Partridge, Dove, Raven, &c. 3. *Fishes*, as the Whale, Herring, Pike, Carp, Thornback, Lobster, Crab, &c. *of which variety of Prints may be bought at reasonable rates.*

VII. *The fourth praxis imitates the* body of man with all its Lineaments, the Head, Nose, Eyes, Ears, Cheeks, Hands, Arms, and shaddows all ex-  
 actly

actly proportional both to the whole and one to another, as well to situation as magnitude.

VIII. *The fifth praxis is in Drapery, imitating Cloathing, and Artificially setting off the outward Coverings, Habit & Ornaments of the Body, as Cloath, Stuff, Silk and Linnen, their natural and proper folds, which although it may seem something hard to do, yet by much exercise and imitation of the choicest Prints, will become facile and easie.*

IX. In drawing of all the aforegoing forms, or what ever else, you must be perfect, first in the exact proportions: secondly in the general or outward lines, before you fall to shadowing or trimming of your work within.

X. In mixed & uncertain forms, where Circle and Square will do no good (but onely the *Idea* thereof in your own fan-  
sie) as in Lions, Horses, and the like; you must work by reason in your own judgment, and so obtain the true proportion by daily practice. Thus,

*Having the shape of the thing in your mind,*

mind, first draw it rudely with your coal, then more exactly with your lead or pencil; then peruse it well, and consider where you have erred, and mend it, according to that Idea, which you carry in your mind; this done, view it again, correcting by degrees the other parts, even to the least Jota, so far as your judgement will inform you; and this you may do with twenty, thirty, forty or more papers of several things at once: having done what you can, confer it with some excellent pattern or print of like kind, using no rule or compass at all, but your own reason, in mending every fault, giving every thing its due place, and just proportion; by this means you may rectifie all your errors, and step an Incredible way on to perfection.

CHAP.

## C H A P. IV.

*Of Drawing the face of a Man.*

**I.** IN drawing of the face you are first to observe its motion whether upwards, downwards, forwards, or sideways; whether it be long or round, fat or lean, great or little.

*For if it be fat, the cheeks will seem to swell: if lean, the jaw bones will stick out, and the cheeks fall in; but if neither too fat, nor too lean, it will be for the most part round.*

**II.** Touch lightly the features where the eyes, mouth, nose, and chin should stand, (having first drawn the circle or oval of the face) then make a stroak down from that place of the forehead which is even with the chin, coming down where you should place the middle or tip of the nose, and middle of the mouth, which stroak must be made straight down in a full right face, but  
arched

arched or oval (in an oblique face) leaning that way towards which the face doth turn : then cross the stroak about the middle of the eyes, either with a straight line in a right face, or with a Curved either upwards or downwards according to the present action or posture of the face : then make another answerable to that, where the end of the nose should come ; and another for the mouth, that it be not made crooked.

III. Then if the face look upwards toward heaven, or downwards towards the earth, let the eyes, nose, mouth, and brows look accordingly with it ; and now proceed to the placing of the features.

IV. In a just proportioned face, the distances, 1. between the top of the forehead, and the eye-brows, 2. between the eye-brows and the bottom of the nose : 3. between the bottom of the nose and the bottom of the chin ; are equal.

V. In drawing the utmost circumference of a face, take in the head and all with

with it, lest you be deceived in drawing the true bigness.

VI. Then consider all those chief touches which give life to a face, adding grace thereto, and something discovering the disposition of the mind.

*So the mouth extended and the corners a little turning up, shews a smiling countenance: the eye-brow bending, and the forehead and top of the nose between the eye-brows wrinkled, shews one frowning: the upper eye-lid coming something over the ball of the eye, shews one sober and stayed: with many other touches which give life and spirit to a face, which in good paints, by little and little, and diligent observation you will at last find out.*

VII. The distances between the eyes, is the length of one eye in a full face, but in a three quartered or half-face, it is lessened proportionably: and exactly underneath the corners of the eyes, place the nostrils.

VIII. Having given touches where the eyes, nose, mouth, and chin should be

be placed, begin to draw them more exactly, and so proceed till the face be finished; and then make the hair, beard, shadows, and other things about it.

IX. Be sure to make the shadows rightly, and be sure not to make them too dark, where they should be faint; for that can never be made light again, and so the whole face is marr'd.

*The shadows are fainter and lighter in a fair face than in a swarthy.*

X. When you have finished the face, give here and there some hard touches with your pen where the shadows are darkest; then come to the ears and hair, wherein having drawn the outline, draw the principal curls, or master brook in the hair, which will be a guide to you in the lesser curls whose dependence are on them: always make the curls to bend exactly according to the pattern, that they may lie loose, or carefully, and not as if they were stiff and forced; the curls being rightly drawn



in the last place strike in the loose hairs which hang scatteringly out of the Circles.

XI. Lastly, having practised a little by rule, and brought your hand in; in drawing of any thing, first strike the out-stroaks, principal veins, and muscles lightly, and afterwards shadow them, ever following exquisite patterns and prints, which will both encrease your judgement, and bring command to your hand.

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## CHAP. V.

### *Of the extreme parts.*

I. **I**N drawing the hands, draw not all the joynts, veins or other things to appear plainly, but onely lightly and faintly, and strike out the bigness of the hand, and the manner of its turning with faint touches, and not with hard stroaks; then that being done right, part the fingers according to the pattern with

with like faint strokes; then mark that place where any of the fingers do stand out from the others, with a faint resemblance: this done proceed to draw it more perfectly, making the bending of the joynts, the wrists, and other principal things more exactly; and lastly, go over with it again, drawing every small bending or swelling of the fingers, nails, knuckles and veins, so many as do appear.

II. Learn by good prints the just proportions of the hands, with their equal distances, observing this rule, that according as it turns one way or another, to shorten proportionally as they appear to the eye.

*For so much as it turns away from our eye, so much it loses in proportion, yea sometimes a whole finger, two or three or more is lost to our sight, which you must accordingly answer in your draught.*

III. In drawing of the feet, the same rules which we even now enumerated at the 1. & 2. are to be understood here.

## C H A P. VI.

*Of Drawing the whole Body.*

I. **F**irst begin with the head, and be sure to give it its just proportion, answerable to what you intend the whole body shall be; then draw the shoulders in their exact breadth; after them, the trunk of the body: beginning at the Armpits, and so drawing down to the hips on both sides, observing withal the exact breadth of the Waist; Lastly, draw the legs, arms and hands, exactly to your pattern.

II. But first draw with a coal, and that very lightly and faintly, drawing nothing perfect (that you may the easier mend it if it be amiss) and then afterwards finish one thing after another as curiously as you can.

III. Let the parallel sinews, muscles, veins and joynts, be placed opposite one to another in a straight line (as shoulder

to shoulder, hip to hip, knee to knee, &c.) for which purpose draw straight cross lines to guide you therein; observing that which way soever the body turns or bows, these lines may answer accordingly.

IV. Let all perpendicular joynts, and parts also, be placed in a right line one under another (as they are in your pattern) for which end, draw a straight line (if the body be straight) from the throat through the middle of the breast and privities, to the feet, to which line draw all those particular points parallels that the body may not appear Crooked or awry.

V. In bowings and bendings of the body, let the extuberance of the outward part be just equal to the compression of the inward part: making all things of an equal proportion; that as opposite parts may be equal (as the arm to the arm, leg to leg, &c.) so every part may be proportionable to each other, (as the hand not too big for the arm, nor the arm for the body, nor the

the body, for the legs, &c.) onely with this difference that, (as the one part may appear fully to the eye, or the other may turn away either in part, or in whole, or be seen sideway) it be made so much less than the other, by so much as it turns away from the sight.

**V.I.** As you observe a just proportion in bigness, so also in length, that as every opposite part be of equal length, so that each part may not be too long one for another, but according to the proposed magnitude: And in this case that if the body be awry, or any ways hid, those parts may shorten accordingly, to what is out of sight.

**V.II.** Lastly, Observe the just distance of one thing from another, for by that means you will be more exact in your draught; and in short time, perfectly imitate your pattern or nature.

## C H A P. VII.

*Of Shadowing a naked body.*

I. **T**He shadows of the neck, in a child or young woman, are very fine, rare, and hard to be seen: In a man, the sinews and veins are expressed by shadowing of the rest of the neck, and leaving them white: the shoulder is shadowed underneath: the brawn of the arm must appear full and white; shadowed on one side.

II. The veins of the back of the hand, and the knuckles, are made with two or three hair stroaks with a fine touch of the pen.

III. The paps of a man are shewed by two or three stroaks given underneath: in a woman with an orbicular shade somewhat deep; the ribs retain no shadow, except you represent one lean or starved.

IV. The belly is made eminent by shadow

shadowing underneath the breast bone and the flank : The brawn of the thigh is shadowed by drawing small hair stroaks from the hip to the knee, and crossed again overthwartly.

V. The knee is to be finely shadowed underneath the joynt ; the shin bone appears by shadowing one half of the leg with a single shadow.

VI. The anckle bone appears by shadowing a little underneath ( as in the knees ) and the sinews thereof must seem to take beginning from the midst of the foot ; and to wax bigger as they grow neerer to the toes.

VII. Lastly, the shadows of the foot must take place according as reason and occasion requires , for which ( as also in all the former precepts ) the having of good prints will be no small advantage unto you.

## C H A P. VIII.

*The way and manner of Shadowing.*

I. **I**F it be a surface only it is best shadowed by drawing lines (either straight or oblique, according as the superficies is) through the better half thereof.

2. If it be in a body, it is a double shadow, and is used when a superficies begins to forsake your sight, as in Columns and Pillars, where it is double darkned, and representeth to the eye, as it were the backside, leaving that unshadowed to the light.

III. The treble shadow, is made by crossing over again the double shadow; and is used for the inward parts of things, as in clefts of the earth, wells, caves, the insides of pots, cups and dishes.

IV. In shadowing let the shadow always fall one way, that is on the same side



side of the body; leaving the other to the light.

*So in drawing a man, If I begin to shadow his right cheek, I must shadow the right part of his neck, arm, side, thigh, leg, &c.*

V. But if the light side of the body be darkned by the opposition of some other body standing between the light and it, it must receive a contrary shadow, according as the light is obfuscated.

*So if three pillars stand together, that in the midst must receive a shadow on both sides.*

VI. All circular bodies must have a circular shadow (by the 1. e) according to their form or appearance, and the orbicular shadow of the object which casteth it.

VII. Let your shadow grow fainter and fainter, according to the greatness of the distance from the opacous body shadowing.

*And the reason is because all shadows are pyramidal, in which case, space*

*of place prevails with the light against the shadow.*

VIII. Where contrary shadows concur, let the meanest and most solid body be first served; and in double and treble shadows, let the first lines be very dry for fear of blotting, before you cross them.

IX. All perfect lights receive no shadow at all; but being manifest, are only to be made apparent by that body which receives them; whose shadow must be according to the efflux of light; but the colour of the light ought to agree with the medium which receives it, whether it be Air, Crystal, Water, Amber, Glass, Transparent-wine, or the like.

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## CHAP. IX.

*Of Expressing passions in the Countenance*

I. **L**OVE is expressed by a clear, fair and pleasant Countenance, with

out clouds, wrinkles, or unpleasant bendings : giving the forehead an ample height and breadth with majestick grace ; a full eye with a fine shadow at the bottom of the eye-lid, and a little at the corner : a proportionable nose ; nostrils not too wide : a clear cheek made by shadowing of it on one side : and a smiling mouth, made by a thin upper lip, and shadowing the mouth line at the corners.

II. FEAR is expressed by making the eyes look hollow, heavy and downward, thin fawn cheeks, close mouth, and staring careless hair about the ears.

III. ENVY is best decyphred by the only hanging of the cheeks, and a pale countenance ; and sometimes by grinning of the teeth.

IV. Let every passion be represented according to the outward appearance thereof, as it is in those persons in whom it reigns ; observing the rules at the 6 è 4.

## C H A P. X.

*Of Humane Proportion.*

I. **T**He length of an upright body is equal to Eight times the length of the face or head : The arm hanging straight down, reacheth within a span of the Knee : The length of the hand, must be the length of the face : The arms extended must be the just length of the body.

II. Those parts of the body near to the Eye must be made greater and longer than those farther off, (because the eye judgeth so of them,) and according to the distance from the eye, so must you vary from that which is otherwise the real true proportion of those parts.

III. In foreshortning you must take things as they appear to the eye, and not to draw the full proportion of each part, but to shorten all, according to the rate or reason which is obfuscated.

So if you would draw a ship foreright, there can appear but only her forepart (for the rest being hid cannot be exprest:) the like of an horse looking full in my face, or a man lying along, I must here of necessity fore-shorten to exprest the Visual property: And in this case your eye and reason, must be your chief guide to give the true reason and measure of these appearances, whether in Drawing, Limning or Painting.

IV. The use of this foreshortning is to exprest all manner of actions in man or beast; to represent many things in a little room; to shew at one view to the eye and mind, the whole body of a temple, with all its arches and pillars whether the inside or outside, as also the sundry sides of Cities, Castles, and Forts, and such like.

V. Lastly, That in every case you make nature the pattern of all draughts, so that nothing be exprest, but what doth agree and accord with nature; and that nothing be either forced beyond nature, nor yet any thing to come short of nature.

As

*As if in drawing the picture of a man, be sure you draw not such a posture as is impossible for him to imitate with his natural body.*

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## C H A P. XI.

### *Of Drapery.*

I. **D**Raw the out-lines of the Garment lightly, and herein be careful, for the whole grace of the picture lyes there; then draw the greatest fold first, and stroak those into lesser, and be sure they cross one another.

II. Suit your garments to the body and make them bend with the body according as it stands in or out, streight or crooked, or turns one way or another: the closer the garment fits to the body, the narrower and smaller must the folds be.

III. All your folds must consist of two lines and no more, which you may turn with the garment at pleasure, the

dow

drawing the innermost deeper, the outermost more light; and if the folds be never so curiously contrived, spare not to shadow them (if they fall inward from the light) with a double or treble shadow, as the occasion requires.

IV. The greater folds must be continued through the whole garment, the lesser you may break off and shorten as you please.

V. The shades of silk and fine linnen, are very thick and small, which requires little folds and a light and rare shadow, commonly but double at most; and so also fine Drapery requires more and sharper folds than course.

VI. That part of a garment which fits close to the body, must not be folded at all but only sweetly shaded, to represent the part of the body which lies under it.

VII. Observe the motion of the wind and air, for driving loose apparel all one way, drawing that part of the garment first which lyes highest and closest upon the body, before you draw the looser part

part that flies off from the body, lest by drawing the loose part of the garment first you should be out, and so place the body crooked or awry.

## CHAP. XII.

### *Of Mixed and Uncertain Forms.*

I. **F**OR the drawing the form of any beast, begin with your lead or coal at the forehead, drawing downward the nose, mouth, upper and nether chop, ending your line at the throat; then viewing it again when you begun, from the forehead, over the head, ears and neck, continuing till you have given the full compass of the buttock, then mark out the legs and feet: Viewing it again, touch out the breast with the eminency thereof; Lastly, finish the tail, paws, tongue, teeth, beard, and several shadows.

II. In drawing beasts you must be well acquainted with their shape and action.



action, without which you shall never perform any thing excellent in that kind: and here if you draw it in an Emblem or the like, you ought to shew the landskip of the Country natural to that beast.

III. In birds begin also the draught at the head, (and beware of making it too big) then bring from under the throat, the breast line down to the legs, there stay, and begin at the pinion to make the wing, which being joyned to the back line, will be presently finished: the eye, legs and train must be at last, letting always (in birds as in beasts) the farthest leg, ever be shortest; their feathers (as the hair in beasts) must take their beginnings at the head very small and fall in one way backwards in five ranks, greater and greater to the conclusion.

IV. Insects, as flies, bees, wasps, grasshoppers, worms and such like, are easie to be drawn and not hard to be laid in Colours; in doing these, it will at last, be really necessary to have the living

living pattern before your eyes.

V. To draw a flower, begin from the boss, tuft or wart in the middle; as in a Rose or Marigold; with the yellow tuft, which being made draw lines equally divided, from thence to the greatest compass or extent of your flower: you may draw them either fully open or in the bud, and laden with dew, wet, and worms, and then you may draw rudely with the coal or lead the leaves afterwards, giving them their veins or jaggedness.

VI. To take the natural and lively shape of the leaf of any herb or tree,

First, take the leaf that you would have and gently bruise the ribs and veins on the back-side of it: afterwards wet the side with linseed oyl, and then press it hard upon a piece of clean white paper, and so you shall have the perfect figure of the said leaf with every vein thereof so exactly expressed as being lively coloured it will seem to be truly natural.

## C H A P. XIII.

*Of Landskip.*

I. **L**andskip is that which expresseth in lines the perfect vision of the earth, and all things thereupon, placed above the horizon, as towns, villages, castles, promontaries, mountains, rocks, valleys, ruines, rivers, woods, forests, chafes, trees, houses and all other buildings, both beautiful and ruinous.

II. First, Always express a fair horizon, shewing the heavens, cloudy or clear, more or less according to the occasion; and if you express the Sun, let it be either as rising or setting, and as it were behind or over some hill or mountain.

The Moon & Stars are seldom or never depicted, unless it be in representation of twilight; because all things are supposed to be seen by day.

III. Secondly, If you express the Sun,  
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make his light to reflect upon all the trees, hills, mountains, rocks, or buildings; shading the contrary side; after which manner also shadow clouds, mists and the like: making the shadows to fall all one way.

IV. Thirdly, be very careful to augment or lessen every thing proportionably to their distance from the eye, making them either bigger or lesser.

V. In expressing things at large distances, as ten, twenty or thirty miles off; where the object is hard to be discerned, as whether it be Temple, Castle, House or the like; shew no particular signs thereof, or any eminent distinction; but rather as weakly, faintly, and confusedly as the eye judgeth of it.

VI. If Landskips be laid in Colours, the farther you go, the more you must lighten it, with a thin and airy blew, to make it seem as it were afar off, beginning at first with a dark green, so driving it by degrees into a blew, according to the distance.

VII. Make your Landskip to shoot

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(as it were) away, one part lower than another, making the nearest hill or place highest, and those that are farther off, to shoot away under that, that the Landskip may appear to be taken from the top of an hill.

VIII. Let every thing have its proper motion, as *in trees* when they are shaken with the wind, making the smaller boughs yielding; the stiffer less bending: *in clouds* that they follow the winds: *in rivers*, the general current, and flashing of the water against the boat-sides: *in the Sea*, the waves and other proper agitations; and lastly, let every thing which moveth whether essentially or accidentally, have its proper representation.

IX. Let your work imitate the season you intend it for.

As if you intend it for a winter piece, represent felling of wood; sliding upon the Ice; fowling by night; hunting of bears or foxes in the snow; making the trees every where naked or laden with the hoar frost; the earth bare without greenness, flowers or

cattel; the air thick; water frozen, with carts passing over it, and boys upon it, &c.

X. Lastly, Let every site have its proper *parergra*, adjuncts, or additional graces, as the farm house, wind-mill, water-mill, woods, flocks of sheep, herds of cattel, pilgrims, ruines of temples, castles and monuments; with a thousand such other onely proper to particular subjects.

## CHAP. XIV.

### *Of Diapering and Antique.*

I. **D**iapering, is a tracing or running over your work again when you have (as it were) quite done, with damask branches, and such like.

*It is used to counterfeit cloath of gold, silver, damask, velvet, chamlet and the like with what branch and in what fashion you please: it is derived from the Greek word διαπεραω transeo, to pass over,*

*and*

and onely signifies a light passing over the same again.

II. If you Diaper upon folds, let your work be broken off accordingly, and taken as it were by the half.

For reason sheweth that the fold covereth something which cannot be seen by reason of it, which if it was drawn forth at length would all appear plain.

III. Let the whole work be *homogene*; that is, let the same work be continued throughout the whole garment, setting the fairest branch in the most eminent and perspicuous place, causing it to run upwards, for else your work would be ridiculous.

IV. You may either shadow the ground and leave your work white; or shadow your work and leave the ground white; and as you shall please in this kind, your filling may be with small pricks, which will shew very fair.

V. Antique (*ab antes*) are buttresses whereon the building is stayed, as also the outwardmost ranges, used in fore-

fronts of houses, in all manner of Compartments, curious Architecture, Armours, Jewels, and Columns.

V I. The form of it is ( only for delightsake ) a general or irregular composition of men, beasts, birds, fishes, and flowers and such like, without either rule or reason.

V II. Lastly, observe the continuation of one and the same work, through the whole piece without the least change or alteration.

*As if it be naked boys, playing, lying, sitting, or riding upon goats, eagles, dolphins and the like; strings of pearl, Satyrs, Tritons, apes, dogs, oxen, bearing or drawing fruits, branches, or any wildfancie after your own invention, with a thousand such other idle toys; be sure you observe the continuation.*



## C H A P. XV.

*To take the perfect draught of any Picture.*

I. **T**Ake a sheet of fine *Venice* paper, wet all over with linseed oyl on one side thereof, which then wipe off as clean as you can; let the paper dry, and lay it on any printed or painted picture; then with a black-lead pen you may draw it over with ease: put this oyled paper upon a sheet of clean white paper, and with a little pointed stick or feather out of a swallows wing, draw over the stroaks which you drew upon the oyled paper, so shall you have the exact form upon the white paper, which may be set out with colours at pleasure.

II. *Or thus*, The picture being drawn as before in the oyled paper, put it upon a sheet of white paper, and prick over the drawing with a pen: then take some

small coal, powder it fine and wrap it in a piece of some fine linnen, and bind it up therein loosely, and clap it lightly, all over the pricked line by little and little, and afterwards draw it over again once or twice, with pen or pensil.

III. *Or thus*, Rub a sheet of white paper all over on one side with black lead, or else with vermillion mixed with fresh butter; lay the coloured side upon a sheet of white paper; then lay the picture you would copy out upon the other side of the coloured paper, and with a small pointed stick or swallows quill, go over all the stroaks of your picture, and it will be exact on the white paper.

IV. *Or thus*, Lay a piece of Lanthorn horn upon the picture, then draw the stroaks of your picture with a hard nibbed pen upon the horn; and when it is dry, breath upon the horn twice or thrice, and press it hard upon white paper a little moistned.

V. *Or thus*, Take an oyled sheet (as at the 1<sup>e</sup>. ) rub one side of it with

with lamb black or lake; lay it upon a sheet of fair paper with the coloured side downwards, and upon it lay the picture you would copy out, and trace it over with a swallows feather.

VI. *Or thus*, Take fine lake mixed with linseed oyl, and draw with it in stead of ink, all the out-stroaks of any picture, and other material parts, then wet the contrary side of the picture and press it hard upon a sheet of paper, and it will leave behind it all that which you drew over.

VII. *Or thus*, Grind printers black fine, and temper it with water, and with a pen dipt in it, draw over the out-lines and master stroaks: wet then some white paper with a spung or the like, and press it hard thereupon; and you shall have the stroaks you drew upon the white paper.

VIII. *Or thus*, Lay the print (the back-side of it) upon a clear glass, or oyled paper, then lay a clean paper upon the print; hold it up against the light, so will you see all the stroaks which

which you may draw out, and shew also if you please.

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## C H A P. XVI.

*To extend or contract a Picture keeping the proportion.*

I. **E**Ncompass your picture with one great square, which divide into as many little ones as you please: this done according as you would have your picture either greater or less, make another square greater or less, which divide into as many equal squares, which be drawn with a black lead plummet.

II. Take your black lead pen, and draw the picture by little and little, passing from square unto square (by the example of the pattern) until you have gone all over with it: observing, that in what part of the square the picture lies, you draw the like part in the square answerable thereto, till you have finished the whole.

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III. Then draw it over with a pen, in which second drawing of it you may easily mend any fault, and shadow it at pleasure.

IV. *Lastly*, when it is thoroughly dry, rub it over with the crum of white-bread, and it will take off all the black lead strokes, so will your draught remain fair upon the paper.

## CHAP. XVII.

*To Express the Powers.*

**E**TERNITY, It is expressed in the form of a fair Lady, having three heads, signifying time past, present, and to come; in her left hand a circle, pointing with the forefinger of her right hand up to heaven: the circle signifies she hath neither beginning nor end.

*In the Medals of Trajan she was figured red, sitting upon a Sphear, with the Sun in one hand, the Moon in the other (by her sitting is signified perpetual constancy.)*

cy.) In the Medals of Faustina, she is drawn with a vail; and in her right hand the Globe of the World.

II. TIME, It is drawn standing upon an old ruine, winged, and with Iron teeth. Or thus, An old man in a garment of stars; upon his head a garland of roses, ears of corn, and dry sticks, standing upon the Zodiaque, with a looking glass in his hand; two children at his feet, the one fat, the other lean, writing both in one book; upon the head of one the Sun, upon the other the Moon. Or thus, An old man, bald, winged, with a fish and an hour-glass.

III. FATE, A man in a fair, long flaxen robe, looking upwards to bright stars encompassed with thick clouds from whence hangs a golden chain.

IV. FORTUNE, A naked Lady having an Insign or Sail overshadowing her, standing upon a globe or ball.

V. EQUALITY, A Lady lighting two torches at once.

VI. VICTORY, Is expressed by a Lady clad all in Gold, in one hand

helmet, in the other a pomegranate : by the helmet is meant force ; by the pomegranate unity of wit and Counſel.

Augustus drew her with wings ready to fly ſtanding upon a globe, with a garland of Bays in one hand, in the other a Coronet of the Emperour, with theſe words Imperator Cæſar. In the Medals of Octavius, ſhe is drawn with wings, ſtanding on a baſe, in one hand a palm, in the other a crown of gold.

VII. PEACE, Is drawn like a Lady, holding in her right hand a wand or rod downwards towards the earth, over a hideous Serpent of ſundry colours ; and with her other hand covering her face with a vail, as loath to behold ſtrife or war.

Trajan gave a Lady, in her right hand an Olive branch, in her left a Cornucopia. In the Medals of Titus, a Lady having in one hand an Olive-branch, the other leading a Lamb and Wolf coupled by the necks in one yoke : the Olive is always the embleme of peace.

VIII. PROVIDENCE, A Lady liſting

lifting up both her hands to heaven with this word *Providentia Deorum*. Or thus, A Lady in a robe, in her right hand a Scepter, in her left a *Cornucopia*, with a globe at her feet.

IX. CONCORD, A Lady sitting in her right hand a charger for sacrifice in her left a *Cornucopia*, with the word *Concordia*. Or thus, A fair Virgin, holding in one hand a Pomegranate; in the other a Mirtle bunch.

The nature of these trees are such that if planted though a good space one from another, they will meet, and with twining, embrace one another.

X. FAME, A Lady clad in a thin and light garment, open to the middle thigh, that she might run the faster; two exceeding large wings; garment embroidered with eyes and ears, and blowing of a trumpet.



## C H A P. XVIII.

*Of Vertues and Vices.*

**V**ERTUE, Is represented by Hercules, naked with his Lyons skin, and knotted club, performing some one of his Labours; as offering to strike a dragon keeping an Apple-tree; or holding in his hand three golden Apples.

Hercules is nothing else but Vertue, his name in Greek is ΗΕΡΚΛΗΣ quasi ΗΕΥΕ ΚΛΕΙΣ Junonis gloria: vel quia ΚΛΗΘΗ ΤΩ ΕΗΡΩΑΣ Celebrat aut commemorat Heroas, which is the property of Vertue: he is drawn naked to shew her simplicity: by the dragon are meant all manner of vices: by the Lions skin, magnanimity: by his Oaken Club, Reason: by its knottiness, the difficulty and labour in seeking after vertue: by the three golden Apples, three Heroical Vertues, Moderation, Content and Labour.

II. PIETY, Is drawn like a Lady, with a sober countenance ; in her right hand a sword stretched over an Altar ; in her left hand a Stork ; by her side an Elephant and a child.

*The Stork is so called of ~~sey~~ the reciprocal love of parent and child, of which this bird was always an Emblem, for the love and care she hath of her parents being old : the Elephant worships towards the rising of the Sun.*

III. HOPE, Is drawn like a beautiful child in a long robe hanging loose standing upon tiptoes, and a trefoyl of three leaved grass in its right hand, in its left an Anchor.

*The loose garment shews, she never pincheth or binds truth ; standing on tiptoes shews she never standeth firm ; the branch of trefoyl shews knowledge ( the ground of faith ) faith ( the ground of hope ) and hope it self.*

IV. MERCY, A Lady sitting upon a Lion, holding in one hand a Spear, in the other an Arrow ; which she seemeth to cast away.

In the Medals of Vitellius she sits with a branch of Bays in her hand, and a staff lying by her.

V. FELICITY, A Lady sitting in an Imperial throne, in the one hand a *Caduceus* or Rod, in the other a *Cor-nucopia*.

VI. FRUITFULNESS, A Lady sitting upon a bed, and two little Infants hanging about her neck.

VII. DISSIMULATION, A Lady wearing a vizard of two faces, in a long robe of changeable colour; and in her right hand a Magpye.

VIII. SECURITY, A Lady leaning against a pillar, before an Altar, with a Scepter in her hand.

## CHAP. XIX.

### Of Rivers.

I. HEREIN you ought to observe the Adjuncts and properties of the same; which consists in some notable

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Accident done near them; some famous City, trees, fruits, or reeds situate upon their banks; some fish only proper to their streams; or recourse of shipping from all parts of the world.

I I. Therefore you had best place the City upon their heads; their fruits in a *Cornucopia*; reeds, flowers, and branches of trees in their Garlands, and the like.

I II. The River TIBER. It is expressed (in the *Vatican* in *Rome*) in a goodly Statue of Marble lying along (for so you must draw them) holding under his right arm a she Wolf, with two little infants sucking at her teats, leaning upon an Urne or Pitcher, out of which issues its stream: in his left a *Cornucopia* of delicate fruits, with a grave Countenance and long beard; a garland of flowers upon his head; and resting his right leg upon an Oar.

IV. The River NILUS. It is seen (in the *Vatican*) cut out in white Marble, with a garland of sundry fruits and flowers, leaning with his left arm upon a

a Sphynx ; from under his body issueth its stream ; in his left arm a *Cornucopia* full of fruits and flowers on one side, and a Crocodile on the other side, with sixteen little children smiling and pointing to the flood.

*The Sphynx was sometimes a monster which remained by Nilus : the Crocodile* καὶ τὸ κροκόδειλον *from his hatred of Saffron, the most famous monster of Egypt : the sixteen children the sixteen cubits of height, the uttermost of the flowing of Nilus : their smiling looks, the profit of it which gladdens the hearts of the Sun-burnt inhabitants.*

V. The River TIGRIS. It was drawn like an old man (as the rest) and by his side a Tiger.

*This beast was given it aswel for its fierce streams, as for the store of Tigers which are there.*

VI. The river GANGES. It bears the shape of a rude and barbarous savage, with bended brows, of a fierce and cruel Countenance, crowned with a palm, having (as other floods) his

pitcher, and by his sides a *Rhinoceros*.

*This River runneth through India, and hath its head from a fountain in Paradise.*

VII. The River INDUS. It is drawn with a grave and jovial aspect with a garland of its country flowers by its side a Camel (from *χαίμα*;) it is represented pleasantly; grave as an Embleme of the *Indian* pollicy.

*This is the greatest River in the world receiving into its channel threescore other great and famous Rivers, and above a hundred lesser.*

VIII. The River THAMESIS. In the house of an honourable friend I saw the *Thames*, thus drawn: A Captain or Souldier lying along holding in his right hand a Sword, and under his arm the August tower: in the other a *Cornucopia* of all fragrancies, with a Golden chain which held four Crowns; and with this he encompassed the stream from under which bending of his legs and arms they seemed to flow: his temple

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were adorned with Bays, the River was empaled on one side with Anchors, and on the other, stood *Cæsar's Augusta*.

## C H A P. XX.

## Of Nymphes.

I. ΝΥΜΦΗ, *Nympha*, a Bride (from *νύξ* & *παρθένος*, as it were a fresh or new creature: or as some will have it from *Nympha* quasi *Lympha*, by changing L. into N. after the *Dorick* dialect: ) it is nothing else but an Allegory, from the Vegetative humidity, which gives life to trees, herbs, plants and flowers, by which they grow and increase.

II. They are fained to be the daughters of the Ocean, the mother of floods, the nurses of *Bacchus*, and goddesses of fields, who have the protection and charge of mountains, herbs, woods, meadows, rivers, trees, and generally of the whole life of man.

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III. First,

III. *First*, Napææ, *Nymphes of the Mountains.*

Let them be drawn of a sweet and gracious aspect, in green mantles, girded about in the middle; and upon their heads garlands of honeysuckles, wild-roses, tyme and the like; their actions, dancing in a ring, making garlands or gathering flowers.

*They are so called from Νάπαις, the top of an hill, or woody valley.*

IV. *Secondly*, Dryades, *Nymphes of the woods.*

Draw these less fair than the former, of a brown or tawny complexion, hair thick like moss, and their attire of a dark green.

*They are so called from Δρυς an Oak, having their beginning with trees, and dying again with them.*

V. *Thirdly*, Naiades, *Nymphes of floods.*

Draw them beautiful with arms and legs naked, their hair clear as Crystal; upon their heads garlands of water-creffes, with red leaves: their actions, pouring out water.

*They*



*They are so called from N<sup>o</sup> to flow, on bubble as water doth.*

VI. *Thetis*, A Lady of a brown complexion, her hair scattered about her shoulders, crowned with a coronet of Periwinkle and Escallop shells, in a mantle of Sea-green, with chains and bracelets of Amber about her Neck and Arms, and a branch of red Coral in her hand.

VII. *Galatea*, A most beautiful young Virgin, her hair carelessly falling about her shoulders like silver threds, and at each ear a fair pearl, with a double string of them (sometimes) about her Neck and left Arm, a mantle of pure thin and fine white, waving as it were by the gentle breathing of the air, viewing in her hand a spung made of Sea-froth, *she is so called from γαλα, lac, milk.*

VIII. *Iris*, A Nymph with large wings, extended like to a semicircle, the plumes set in rows of divers colours, as yellow, green, red, blew or purple; her hair hanging before her eyes, her breasts

like clouds, drops of water falling from her body, and in her hand *Iris*, or the Flower-deluce.

*Virgil* makes her the messenger of *Juno* (where she is taken for the Air) when he saith, *Irin de Cælo misit Saturnia Juno.*

IX. *Nymphæ Diane*; Let them be clothed in white linnen to denote their Virginitie, and their garments girt about them; their Arms and Shoulders naked; bows in their hand, and arrows by their sides.

X. *Aurora*, the Morning. A young Virgin with carnation wings and a yellow mantle; in her forehead a star, and Golden Sun-beams from the Crown of her head, riding upon *Pegasus*, with a viol of dew in one hand, and various flowers in the other, which she scattereth upon the earth.

## C H A P. XXI.

*Of the Nine Muses.*

I. **C L I O**, She is drawn with a Coronet of Bays; in her right hand a trumpet; in her left a book, upon which may be written *Historia*; her name is from praise or glory.

II. **E U T E R P E**, Is crowned with a garland of flowers, holding in each hand, sundry wind Instruments; her name is from giving delight.

III. **T H A L I A**. Draw her with a smiling look, and upon her Temples a Coronet of Ivy, a Mantle of Carnation embroidered with silver twist and gold spangles, and in her left hand a vizard; her Ivy shews she is mistress of Comical Poesie.

IV. **M E L P O M E N E**. Draw her like a virago, with a majestick and grave countenance, adorn her head with Pearls, Diamonds and Rubies; holding  
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in her left hand Scepters with Crowns upon them, other Crowns and Scepters lying at her feet; and in her right hand a naked poniard, in a Mantle of changeable Crimson. Her gravity befits Tragick Poesie.

V, POLYHYMNIA. Draw her acting a Speech with her forefinger, all in white, her hair hanging loose about her shoulders of an orient yellow, upon her head a garland of the choicest jewels intermixt with flowers, and in her left hand a book, upon which let be written *Suadere*; her name imports memory, to whom the Rhetorician is beholden.

VI. ERATO. She hath her name from *Ἔρως*, *Amor*, *Love*; draw her with a sweet and comely visage, her temples girt with myrtles and roses, bearing an heart with an Ivory Key; by her side *Cupid*, winged, with a lighted torch; at his back, his bow and quivers.

VII. TERPSICHORE; a chearful visage playing upon some Instrument; upon her head a Coronet of Feathers of sundry colours, but chiefly green; in to-

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ken of the victory which the Muses got of the Syrenes, &c. by singing.

VIII. URANIA, A beautiful Lady in an azure robe; upon her head a Coronet of bright stars; in her right hand the Cœlestial globe, and in her left the Terrestial. Her name imports as much as heavenly; *Urania cœli motus scrutator & Astra.*

IX. CALLIOPE, Upon her head draw a Coronet of Gold; upon her left Arm Garlands of Bays in store, for the reward of Poets; and in her right hand three books upon which write *Homerus, Virgilius, Ovidius.*

*The Muses had their names as Eusebius saith, μαγὰ τὸ μῦθον, which is to instruct, because they teach the most honest and laudable disciplines.*

## C H A P. XXII.

*Of the four Winds.*

I. **E***urus*, the East-wind. Draw a youth with puffed and blown cheeks (as all the other winds must be) wings upon his shoulders, his body like a Tauny Moor, upon his head a Red Sun.

II. *Zephyrus*, the West-wind. Draw a youth with a merry look, holding in his hand a Swan, with wings displai'd as about to sing, on his head a garland of all sorts of flowers.

'Tis called *Zephyrus* quasi *ζώνη φέρων* bringing life, because it cherisheth and quickneth.

III. *Boreas*, the North-wind. Draw it like an old man, with a horrid, terrible look; his hair and beard covered with snow, or the hoar-frost; with the feet and tail of a Serpent.

IV. *Auster*, the South-wind, is drawn with

with head and wings wet, a pot or urne pouring forth water, with which descend frogs, grasshoppers, and the like creatures which are bred by moisture.

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## C H A P. XXIII.

*Of the Moneths of the Year.*

I. **J** *January* must be drawn all in white, like snow or hoar frost, blowing his fingers; in his left arm a billet, and *Aquarius* standing by his side.

II. *February* is drawn in a dark skie colour, carrying in his right hand *Pisces*, or Fishes.

III. *March* is drawn tawny with a fierce look, a helmet upon his head, leaning upon a Spade: in his right hand *Aries*; in his left Almond blossoms and Scions; and upon his arm a basket of Garden-seeds.

IV. *April* is drawn like a young man in green, with a garland of Myrtle and Hawthorn-buds, winged; in the  
one

one hand Primroses and Violets; in the other *Taurus*.

V. *May* is drawn with a sweet and lovely aspect, in a robe of white and green, embroidered with Daffadils, Hawthorn and Blew-bottels; on his head a garland of white, red, Damask-roses; in the one hand a Lute; upon the forefinger of the other a Nightingal.

VI. *June* is drawn in a mantle of Dark grass-green; upon his head a Coronet of Bents, King-cobs, and Maiden-hair; in his left hand an Angle; in his right *Cancer*; and upon his Arm a basket of Summer fruits.

VII. *July* is drawn in a Jacket of light yellow, eating Cherries, with his face and bosome Sun-burnt; on his head a garland of Centaury and Tyme, on his shoulder a Sithe; with a bottle at his girdle, carrying a Lion.

VIII. *August* is like a young man of a fierce look, in a flame-coloured robe; upon his head a garland of wheat; upon his arm a basket of Summer-fruits; and his belt a Sickle, bearing a Virgin.

IX. *Septem*



IX. *September* is drawn in a purple robe, with a cheerful look; and on his head a Coronet, of white and purple grapes; in his left hand a handful of Oats, with a *Cornucopia* of Pomegranates and other Summer-fruits; and in his right hand a ballance.

X. *October* is drawn in a garment of the colour of decaying flowers and leaves; upon his head a garland of Oak-leaves with the Acorns; in his right hand a Scorpion; in his left, a basket of Servicees, Meddlars, and Chestnuts.

XI. *November* in a robe of changeable green and black: upon his head, a garland of Olives with the fruit; in his right hand *Sagittarius*: and in his left bunches of Parsneps and Turneps.

XII. *December* is drawn with a horrid aspect, clad in Irish rug, or course Freeze, girt about him: upon his head three or four night-caps, and over them a Turkish Turbant; his Nose red; beard hung with Iceickle; at his back a bundle of Holly and Ivy; holding in Furred Mittens a Goat.

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*Where note it will be good to give every month its natural and proper Landskip, not making blossomes and fruits upon trees in December; nor a barren face of the Earth and Trees in June.*

## C H A P. XXIV.

### *Of Perspective in General.*

‘ΟΠΤΙΚΗ in Greek, *Perspectiva* in Latin, the *Art of seeing* in English, is that by which we behold, contemplate, and draw the likeness of all magnitudes, just in form and manner as they appear to the Eye.

II. The matter to be seen or speculated is a magnitude: the manner of the speculation, is by radiations of Light, either direct, reflected, or broken.

III. A magnitude is that which hath form; and it is either lineal, superficial or solid; that is, either a complication of points; a complication of lines; or a complication of superficies.

I V.

IV. A line is a complication of points; that is (according to EUCLID) a length only without either breadth or thickness.

V. A superficies is a complication of lines; that is, a length having breadth without thickness.

*For as the continuation of points makes a line: so the couching of lines makes a superficies; which is only the laying of points cross wise.*

VI. A solid is a complication of superficies; that is, a length and breadth, having depth or thickness.

*And indeed it is nothing but the continuation of points upon a superficies either perpendicularly or bending.*

VII. The Contemplation of the Object, represents the Matter to the mind, in the same manner as its outward appearance doth to the Eye.

*And from hence comes judgment, whereby the Artist is enabled to describe the same in lines; and delineate it, according to its apparent or visual proportions.*

VIII. To draw or describe the Appear-

pearance in lines is the Active part of this Art, whereby the *Idea* conceived in the mind (by sight and contemplation) is brought to light.

**I X.** A radiation is a beam of light, conveying the likeness of the thing, to the Eyes, or sight; and the Knowledge thereof to the mind or understanding.

*And this radiation is twofold, either external from the external light; or Intellectual from its being and power.*

**X.** *Direct Radiations*, are those which consider the direct or straight beams, which pass between the Eye, and the object.

*And this is the first kind of Perspective; and is many times (alone) called the*  
**OPTICKS.**

**XI.** *Reflected Radiations*, are those which consider the reflection of beams, and their shape upon any polish'd body, as on a Globe, Cone, Cylinder, Pyramid, or any Regular solid.

*And this is the second kind of Perspective, which is called the Art* **C A T O P T R I C A.**

**XII.** *Br*

XII. *Broken Radiations*, are those which consider the breaking of beams, as they are to be seen through a glass or Crystal cut into several plains or superficieses.

*And this is the third and last kind of Perspective which is called the Art DIOPTRICA.*

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## CHAP. XXV.

*Of the Active part of Perspective.*

I. **T**HE Active part of Perspective is either *Ichnographical*, *Orthographical*, or *Scenographical*.

II. *ICHNOGRAPHIA*, is the description of the plain, base or bottom of any body or building.

III. And it is twofold, to wit, either *Geometrical* or *Scenographical*.

IV. *Ichnographia Geometrical*, is that which gives the sight of the bottome or base of any body or building.

*So a Circle is the base of a Column;*

*and a square is the base of a Pedestal; and the like; but this Geometrical Ichnography is not seen in Section, or through a Glass, unless it lies parallel to the base; and so it makes no Section with it.*

V. *Ichnographia Scenographical* is the Appearance of the same base in Section, or through a Glass, erected upright on the same plain, on which the base stands.

*And by this the said base is extended in length but contracted in breadth, for so it appears to the Eye.*

VI. *Orthographia*, is the Vision of the foreright side of any plain; to wit, of that plain or superficies which lies Equidistant to a right line, passing through the outward or convex centers of both Eyes, continued to a due length.

*And therefore Perspective Orthographia, is the delineation of the apparent right plain.*

SCENOGRAPHIA is the description of a plain or other figure, that declines from the apparent or foreright plain; that is, of that plain which makes  
Angles

Angles with the said foreright plain.

*The Scenographick vision of any form, body, or building is, of that side which declines from, or constitutes an Angle, with the right line, passing from the convex centers of both Eyes aforesaid : this Artists call the return of the foreright side. Now the difference between the Orthographick and Scenographick vision is this ; the Orthographick shews the side of a body or building as it is beheld when the plain of the Glass is placed equidistant to that side : but the Scenographick shews the side of a body or edifice as it appears through a glass raised obliquely to the said side, or making an angle therewith.*

## CHAP. XXVI.

*Of the subject to be seen.*

I. **T**HE BASE of any thing, is the plain, flat, or floor, upon which any solid body, or object is placed, or raised.

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II. The

II. The **ALTITUDE** or *height* is the perpendicular space of place, between the base and Eye, or height of the Visual point above the base.

III. The **VISUAL point**, is a point in the Horizontal line, wherein all the beams of the Eyes unite.

*Exempli gratiâ. If you look on a long straight river, the sides of which run parallel, yet by reason of the distance, both sides of the river (although it be very broad) will seem to incline, touch, and unite with each other in one common point or center: and so if you look on a long straight brick-wall, the several lays of brick, and courses of mortar, will (at a great distance) seem to incline each to other in one common point or center; this point reflected on a glass, raised upright on the base, is called the Visual point.*

IV. The **HORIZONTAL line** is a line proceeding from the center of the Eye to the visual point, parallel to the Horizon of the Earth.

*And this is, in men of ordinary height or stature, commonly about five foot from the ground or base.*

V. The



V. The **DISTANCE** is the space on the base, between the Glass, and point in the base which lies directly under the Eyes.

VI. The **SECTION** is a plain of transparent or perlucid matter (as of glass) raised upright on the plain of the base, standing before you, parallel to a straight line, passing through the convex centers of both Eyes.

*Without the knowledge of this Section or Glass, it is utterly impossible to understand perspective, or know what it means: Or be able to give a reason for the difference between the Orthographick and Scenographick figure.*

VII. If the Glass is placed near the Visual point, and far from the object, the figure which is seen will be very small: and the reason is, because all rays comprehending the Orthographical and Scenographical figures (though more remote from the object) fall into the Visual point, as their common center.

VIII. If the Visual point be more elevated (though at the same distance)

the Scenographick figure or form, will appear of a much larger magnitude: because the Visual radiations being higher, the various perpendiculars raised on the Section or Glass, cut them in wider distances, because more remote from the Glass.

IX. If the Glass incline to the Visual point, the Scenographick vision will be long wise between the Visual point and the object.

*And the reason is, because the plain of the Glass, heaps in more of the Visual Radiations.*

X. If the Glass recline from the Visual point, the Scenographick vision will appear rounder, and begin to resemble the Orthographick.

XI. But if the Glass is fixed Equidistant to the base, or plain the object stands on; the Scenographick and Orthographick resemblance will be one and the same.

*And the reason is, because the form of the figure is (lost or) not visible in Section.*

XII. The

XII. The VISUAL RAIES, are those lines which proceed from the Visual point, through the Glass, to any point higher or lower than the plain of the Horizon.

XIII. DIAGONALS or lines of distance are such as are drawn from the point of distance, to any other point, higher or lower than the Horizon.

XIV. The OBJECT is that form, figure, body or edifice intended to be expressed in *Perspective* proportions.

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## CHAP. XXVII.

### *The General Practise of Perspective.*

I. **L** Et every line which in the Object or Geometrical figure, is straight, perpendicular, or parallel to its base, be so also in its Scenographick delineation.

II. Let the lines which in the object return at right Angles from the fore-right-side, be drawn Scenographically

ly from the Visual point.

III. Let all straight lines, which in the object return from the fore-right side, run in a Scenographick figure into the Horizontal line.

IV. Let the object you intend to delineate standing on your right hand, be placed also on the right hand of the Visual point: and that on the left hand, on the left hand of the same point: and that which is just before, in the middle of it.

V. Let those lines which are (in the object) Equidistant to the returning line, be drawn in the Scenographick figure, from that point found in the Horizon.

VI. In setting off the altitude of Columns, pedestals and the like, measure the height from the base line upwards in the front, or fore-right side; and a visual ray drawn, that point in the front shall limit the altitude of the Column or pillar, all the way behind the fore-right side or Orthographick appearance, even to the visual point.

*This*

*This rule you must observe in all figures aswel where there is a front, or fore-right side, as where there is none.*

VII. In delineating Ovals, Circles, Arches, Crosses, Spirals, and Cross-arches, or any other figure, in the roof of any room; first draw Ichnographically, and so with perpendiculars, from the most Eminent points thereof, carry it up unto the Ceiling, from which several points carry on the figure,

VIII. The center in any Scenographick regular figure is found by drawing cross-lines, from opposite angles: for the point where the Diagonals cross is the Center.

IX. A ground plain of squares is alike both above and below the Horizontal line; only the more it is distant above or beneath the Horizon, the squares will be so much the larger or wider.

X. In drawing a perspective figure, where many lines come together, you may for the directing of your eye, draw the Diagonals in Red; the Visual lines  
in

in black; the Perpendiculars in Green, or other different colour from that which you intend the figure shall be of.

XI. Having considered the height, distance, and position of the figure and drawn it accordingly, with side or angle, against the base; raise perpendiculars from the several angles or designed points in the figure, to the base, and transfer the length of each perpendicular, from the place where it touches the base, to the base on the side opposite to the point of distance; so will the diagonals drawn to the perpendiculars in the base, by intersection with the Diagonal drawn to the several transferred distances, give the Angles of the figure: and so lines drawn from point to point will circumscribe the Scenographick figure.

XII. If in Landskip, there be any standing waters, as rivers, ponds, and the like; place the horizontal line level with the farthest sight or appearance of it.

XIII. If there be any houses or the like in the picture, consider their position

tion

tion, that you may find from what point in the Horizontal line to draw the fronts and sides thereof.

XIV. In describing things at a great distance, observe the proportion (both in magnitude and distance) in draught, which appears from the object to the eye.

XV. In colouring and shadowing of every thing; you must do the same in your picture which you observe with your Eye, especially in objects lying near; but according as the distance grows greater and greater, so the Colours must be fainter and fainter, till at last they loose themselves in a darkish sky colour.

XVI. The CATOPTRICKS are best seen in a common looking glass or other polish'd matter, where if the Glass be exactly flat, the object is exactly like its original: but if the glass be not flat, the resemblance alters from the Original, and that more or less, according as the Glass differs from an Exact plain.

XVII. In

XVII. In drawing *Catoptrick* figures, the surface of the Glass is to be considered, upon which you mean to have the reflection, for which you must make a particular *Ichnographical* draught or projection; which on the glass must appear to be a plain full of squares; on which projection transfer what shall be drawn, on a plain divided into the same number of like squares: where though the draught may appear very confused, yet the reflection thereof on the Glass, will be very regular, proportional and really composed.

XVIII. The **DIOPTRICK** or broken beam may be seen in a tube through a Crystal, or Glass, which hath its surface cut into many others, where by the raies of the object are broken. For, to the flat of the Crystal or water the raies run straight; but then they break and make an Angle; the which also by the refracted beams is made and continued on the other side of the same flat.

XIX. When these faces on a Crystal are turned towards a plain, placed directly



rectly before it, they separate themselves at a good distance on the plain; because they are all directed to various, far distant places of the same.

XX. But for the assigning to each of them a place on the same plain, no Geometrick rule is yet invented.

## CHAP. XXVIII.

*A Rational Demonstration of Chiromantical Signatures; Added by way of Appendix to Chap.V. of this Book.*

**T**HE foundation of Chiromancie depends upon the true appropriation of the several mounts, fingers, or places in the hand, to their proper stars or planets.

II. The Ancients have assigned the root of the middle finger to *Saturne*; of the forefinger to *Jupiter*: the hollow of the hand to *Mars*: the root of the ring finger to *Sol*: of the thumb to *Venus*: of the

the little finger to *Mercury*: and lastly, the brawn of the hand near the wrist to *Luna*:

III. That line which comes round the ball of the thumb towards the root or mount of *Jupiter* is called *Linea Jovialis*, or the life line: that from the wrist to the root or mount of *Saturne*, *Linea Saturnialis*: but if it points to the root, or mount of *Sol*, *Linea solaris*: if to *Mercury*, the *Linea Mercurialis*: that which goes from the *Linea Jovialis* to the mount of *Luna*, *Linea Lunaris*, or the natural line: the other great line above it is called *Linea Stellata*, or the line of fortune, because it limits the mounts of the planets, and is impressed with various vertues in those places according to the nature of the planet whose mount it runs under or sets a boundary unto. Lastly, the space between the natural line and the line of fortune is called *mensa*, the Table.

IV. All other lines shall either proceed out of the sides of the former, or else from some proper mount.

V. Ever

V. Every line great or small, long or short, hath a certain beginning or root, from which it rises; and a certain end or point to which it tends.

VI. The distance between both ends, is the way of its passage; in which way, it either crosses some other line, or else is crossed: if it do neither, its signification is continual, and ought so much the more to be taken notice of.

VII. Every mount hath a proper signification, which it receives from the significations of its proper planet, being abstractly considered: the same understand of all the principal lines aforesaid.

VIII. *Saturn* is the Author of Age, Inheritances, Melancholly, Malice, Sorrow, Misery, Calamities, Enemies, Imprisonment, Sicknes, Diseases, Perplexities, Cares, Poverty, Crosses, Death, and whatsoever evil can befall humane life: he signifies Fathers, Old Men, Labourers, Dyers, Smiths and Jesuites.

IX. *Jupiter* is the Author of Health, Strength, Moderation, Sobriety, Mercy,  
G
Riches,

Riches, Substance, Goodness, Liberty, Religion, Honesty, Justice, Modesty, and all other things which may make a Man happy; he signifies Churches, Churchmen, Lawyers, Schollars, Cloathiers, and the like.

X. *Mars* is the Author of Strife, Contention, Pride, Presumption, Tyranny, Thefts, Murders, Victory, Conquest, Infortunacy, Boldness, and Dangers: he signifies Physicians, Chirurgians, Apothecaries, the Camp, all Military Men and Preferments, Edge-tools, Butchers, Carpenters, Gunners, Bailiffs, and the like.

XI. *Sol* is the Author of Honour, Glory, Renown, Preferment, Life, Generosity, Magnanimity, Sovereignty, Dominion, Power, Treasures, Gold, Silver, and whatsoever may make the life of a Man splendid; he signifies, Kings, Princes, Rulers, all men in Power, Mintmen, Goldsmiths, long Life and Wisdom.

XII. *Venus* is the Author of Joy, Pleasure, Mirth, Solace, Lust, Uncleaness and Idleness: she signifies women of all kinds.

kind, Sisters, Ladies, Whores, Curiosities, Lapidaries, Silkmen, Taylors, Mercers, Upholsters, Pictures, Picture-drawers, the Pox, and diseases proceeding from uncleanness.

XIII. *Mercury* is the Author of Craft, Subtilty, Policy, Deceit, Perjury, Study, Hearing, and Merchandizing: he signifies Merchants, Clerks, Scholars, Secretaries, Ambassadors, Pages, Messengers, Poets, Orators, Stationers, Cheaters, Thieves, Petty-lawyers, Philosophers, Mathematicians, Astrologers.

XIV. *Luna* is the Author of popular Fame both Good and Evil, Joy and Sorrow, Mutability and Inconstancy; Affection and Disaffection; Moisture and every affect which may be said to be common: she signifies Waters, Ships, Seamen of all sorts, Queens, Ladies, a Governess, the Common people in general, Neighbours, Mothers, Kindred, Fishmongers, Vintners, Tapsters, Midwives, Nurses and Travellers.

*This being known, understand,*

XV. First, That the lines take their

signification from the mount of that planet from whence they rise.

XVI. *Secondly*, That the place from whence any line rises shews the ground, cause, or original of the things signified by that line : the line or mount to which it points, shews the Issue, to what the thing tends, and what may be the end of the matter signified.

XVII. *Thirdly*, That whether the line signifies good or evil, if it be cut or crossed by any other line, that line so cutting it, will at a certain time not only abate the good, but also take away the evil, if it so signified.

XVIII. *Fourthly*, That the nature and quality of that line thus destroying the signification of the former, is known by considering from what place it rises and to what place it tends.

XIX. *Fifthly*, That a double judgment arises from every line, by accounting its rise, first from the one end ; Secondly, from the other.

XX. *Sixthly*, That little lines rising out of the sides of any other line, both augment

augment the things signified by that line; and also signifie new matter arising by things signified by the line from whence they rise; and the place to which they point, shew to what they tend.

XXI. *Seventhly*, That the mounts or lines adorned with stars, or small lines, not crossed, or pointing to evil places, shew great good and happiness to the person, by things signified by the same mount or line: and on the contrary, vi-tiated with crosses, spots, or knots, shew much evil and perplexity.

XXII. *Lastly*, the beginning of the lines, shews in the beginning or forepart of Life; the middle, in the middle part of Life; and the ends of them, the latter-part, or end of Life; so that if any evil or good be signified by any line, you must hint it the time according to the a-forefaid reason.

'Tis true, here we ought to enquire into the denominated times when the things signified should come to pass; but because that matter is something long and abstruse being more fit to be handled in a parti-

cular tract, wherein all its curiosities may be examined) this our present work being a subject of another nature, and those things not essential to our purpose, but only added by way of appendix, we shall at this time forbear. Notwithstanding, although we have not here delineated every thing in particular, yet we have laid (as it were) the ground and foundation of the Art; out of which, as out of a fountain, the industrious student, may at his own leisure and pleasure, rear a stately fabric.

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POLY



# POLYGRAPHICES

## *Liber Secundus.*

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### Of Engraving, Etching, and Limning.

Shewing the Instruments belonging to the work; the matter of the work, and the way and manner of performing the same; together with all other requisites and ornaments.

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#### C H A P. I.

*Of Graving, and the Instruments thereof.*

I. **G**RAVING is an Art which teacheth how to transfer any design upon Copper, Brass, or Wood, by help,

help of sharp pointed and cutting Instruments.

II. The chief Instruments are four, 1. Gravers, 2. An Oyl stone, 3. A Cushion, 4. A burnisher.

III. Gravers are of three sorts, round pointed, square pointed, and Lozeng pointed. *The round is best to scratch with all: the square graver is to make the largest strokes: the Lozeng is to make strokes more fine and delicate: But a graver of a middle size betwixt the square and Lozeng pointed, will make the strokes or hatches show with more life and vigour, according as you manage it in working.*

IV. The Oyl-stone is to whet the Gravers upon, which must be very smooth, not too soft, nor too hard, and without pinholes.

The use is thus: *put a few drops of oyl Olive upon the stone, and laying that side of it, (which you intend shall cut the Copper) flat upon the stone, whet it very flat and even; and therefore be sure to carry your hand stedfast with an equal strength,*  
pla.

placing the forefinger firmly, upon the opposite side of the graver. Then turn the next side of your graver, and whet that in like manner, that you may have a very sharp edge for an Inch or more. Lastly, turning uppermost that edge which you have so whetted, and setting the end of the graver obliquely upon the stone, whet it very flat and sloping in form of a Lozeng (with an exact and even hand) making to the edge thereof a sharp point. It is impossible that the work should be with the neatness and curiosity desired, if the graver be not onely very good, but also exactly and carefully whetted.

V. The Cushion is a leather bag filled with fine sand, to lay the plate upon, on which you may turn it every way at ease.

You must turn your plate with your left hand, according as the stroaks which you grave do turn, which must be attained with diligent care and practice.

VI. The burnishing Iron is of use to rub out scratches and specks or other things

things which may fault your work in the plate ; as also if any stroaks be graved too deep or gross to make them appear less and fainter by rubbing them therewith.

VII. To make your gravers ;

*Provide some Cross-bow Steel, and cause it to be beaten out into small rods, and softened, then with a good file you may shape them at pleasure : when you have done, heat them red-hot, and straight dip it into Soap, and by so doing it will be very hard : where note that in dipping them into the Soap, if you turn your hand never so little awry, the graver will be crooked. If your graver be too hard take a red-hot Charcoal and lay the end of your graver upon it till it begins to wax yellowish, and then dip it into tallow (some say water) and it will be tougher.*

VIII. Have by you a piece of box or hard wood, that after you have sharpened your graver, by striking the point of it into the said box or hard wood, you may take off all the roughness about the points, which was caused by

by whetting it upon the oyl-stone.

IX. Lastly, take a file and touch the edge of the graver therewith; if the file cut it, it is too soft, and will do no good: but if it will not touch it, it is fit for your work.

*If it should break on the point, it is a sign it is tempered too hard; which oftentimes after a little use by whetting will come into a good condition.*

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## CHAP. II.

### *Of Polishing the Copper Plates.*

I. **T**AKE a plate of Brass or Copper of what bigness you please, and of a reasonable thickness, taking heed that it be free from fire flaws.

II. Beat it as smooth as you can with a hammer, and then rub it as smooth as you can, with a pumice stone void of Gravel (lest it scratch it and so cause as much labour to get them out) and a little water.

III. Then

III. Then drop a few drops of oyl Olive upon the plate, and burnish it with your burnishing Iron; and then rub it with Charcoal made of Beech wood quenched in Urine.

IV. Lastly, with a roul made of a piece of a black felt, castor, or beaver, dip'd in oyl Olive, rub it well for an hour, so shall your plate be exactly polished.

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### C H A P. III.

#### *Of Holding the Graver.*

I. **I**T will be necessary to cut off that part of the knob of the handle of the graver which is upon the same line with the edge of the graver; thereby making (that lower side next to the plate) flat, that it may be no hinderance in graving.

*For working upon a large plate, that part of the handle (if not cut away) will so rest upon the Copper, that it will hinder the smooth*

*smooth and even carriage of your hand in making your strokes, and will cause your graver to run into your Copper deeper than it should do. This done,*

II. Place the knob at the end of the handle of the Graver in the hollow of your hand, and having extended your forefinger towards the point of the Graver, laying it a top, or opposite to the edge which should cut the plate, place your thumb on the one side of the Graver, and your other fingers on the other side, so as that you may guide the graver flat and parallel with the plate.

III. Be wary that your fingers interpose not between the plate and the Graver, for they will hinder you in carrying your graver level with the plate, and cause your lines to be more deep, gross, and rugged, than otherwise they would be.

## C H A P. IV.

*Of the way and manner of Engraving.*

I. **H**AVING a Cushion filled with sand about nine inches long and six broad, and three or four thick, and a plate well polished; lay the plate upon the Cushion, which place upon a firm Table.

II. Holding the Graver (as afore-said) according to art, in making straight strokes be sure to hold your plate firm upon the Cushion, moving your hand, leaning lightly where the stroke should be fine; and harder where you would have the stroke broader.

III. But in making Circular or Crooked strokes, hold your hand and Graver steadfast, your arm and elbow resting upon the table, and move the plate against the Graver; for otherwise it is impossible to make those crooked or winding strokes with that

neat-



neatness and command, that you ought to do.

IV. Learn to carry your hand with such a slight, that you may end your stroke as finely as you began it; and if you have occasion to make one part deeper or blacker than another, do it by degrees; and that you may do it the more exactly, observe that your strokes be not too close, nor too wide.

For your more exact observation, practise by such prints which are more loosely shadowed, lest by imitating the more dark, you should not know where to begin or end.

V. After you have Graved part of your work, it will be needful to scrape it with the sharp edge of a burnisher or other graver, carrying it along even with the plate, to take off the roughness of the strokes; but in doing it beware of making scratches.

VI. And that you may the better see that which is engraven, with the piece of Felt or Castor (at the 4. è. 2.) dipt in oyl, rub the places graven.

VII. Last-

VII. Lastly, whatsoever appears to be amiss, you may rub out with the burnisher and very exactly polish it with your piece of Felt or Castor and oyl, which done, to cleanse the plate you may boil it a little in wine vinegar, and rub it gently with a brush of small brass wire or hogs bristles.

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## C H A P. V.

### *Of the Imitation of Copies or Prints.*

I. **H**AVING a piece of Bees wax tyed up in a fine holland rag, heat the plate over the fire, till it may be hot enough to melt the wax; then rub the plate with the wax tyed up in the rag, till you see it covered all over with wax, (which let be very thin:) if it be not even, heat it again by the fire, and wipe it over gently with a feather.

II. If you would copy a printed picture, to have it print off the same way; then clap the print which you would

would Imitate with the printed side next to the plate; and having placed it very exactly, rub the backside of the print with a burnisher, or any thing that is hard, smooth and round, which will cause it to stick to the wax upon the plate: then take off the print, (beginning at one corner) gently and with care, lest you tear it, (which may be caused also by putting too much wax upon the plate) and it will leave upon the wax the perfect proportion in every part.

*Where note, if it be an old picture, before you place it upon the wax, it will be good to track it over in every limb with a black-lead pensil.*

III. But if you would have it print the contrary way; take the dust of black-lead, and rub the backside of the print all over therewith, which black side put upon the waxed plate; and with your needle or drawing point, draw all the out-lines of the design or print, all which you will find upon the wax. This done,

H

IV. Take

IV. Take a long graver either Lozeng or round (which is better) very sharp, and with the point thereof scratch over every particular limb in the outstroke; which done, it will not be difficult to mark out all the shadows as you engrave, having the proportion before you.

V. Lastly, for Coppies or Letters, go over every letter with black-lead, or write them with ungumm'd Ink, and clap the paper over the waxed plate as before.

## CHAP. VI.

### *Of Engraving in Wood.*

I. **T**He figures that are to be carved or graven in wood must first be drawn, traced, or pasted upon the wood, and afterwards all the other standing of the wood (except the figure) must be cut away with little narrow pointed knives made for that purpose.

*This*

This graving in wood is far more tedious and difficult, than that in Brass or Copper; because you must cut twice or thrice to take out one stroak; and having cut it, be careful in picking it out, lest you should break any part of the work, which would deface it.

II. For the kind of the wood let it be hard and tough: the best for this purpose is Beech and Box: let it be plained inch thick, which you may have cut into pieces according to the bigness of the figure you grave.

III. To draw the figures upon the wood.

Grinde white Lead very fine, and temper it with fair water; dip a cloth therein, and rub over one side of the wood, and let it dry thoroughly: This keepeth the Ink (if you draw therewith) that it run not about, nor sink: and if you draw with Pastils, it makes the stroaks appear more plain and bright.

IV. Having whited the wood as before (if it is a figure you would copy) black or red the blankside of the print

or copy, and with a little stick or Swallows quill, trace or draw over the strokes of the figure.

V. But if you paste the figure upon the wood, you must not then white it over (for then the figure will pill off) but only see the wood be well plain'd: then wipe over the printed side of the figure with Gum Tragacanth dissolved in fair water, and clap it smooth upon the wood, which let dry thoroughly: then wet it a little all over, and fret off the paper gently, till you can see perfectly every stroke of the figure: dry it again, and fall to cutting or carving it.

## CHAP. VII.

*Of Etching, and the Materials thereof.*

I. **ETCHING** is an Artificial Engraving of Brass or Copper Plates with *Aqua fortis*.

II. The Instruments of Etching (beside

sides the Plate) are these nine. 1. *Hard Varnish.* 2. *Soft Varnish.* 3. *Prepared Oyl.* 4. *Aqua fortis.* 5. *Needles.* 6. *Oyl stone.* 7. *Brush-pensil.* 8. *Burnisher.* 9. *The Frame and Trough.*

### III. *To polish the Plate.*

Although in chap. 2. of this Book, we have sufficiently taught how to polish the Plate, yet nevertheless we think it convenient to subjoyn these following words. First, the Plate being well planished or forged, chose the smoothest side to polish; then fix it upon a board a little declining, and rub it firmly and evenly all over with a piece of Grindstone, throwing water often on it, so long till there be no dints, flaws, or marks of the hammer: wash it clean; and with a piece of good Pumice stone, rub it with water so long till there be no rough strokes or marks of the Grindstone: wash it clean again, and rub it with a fine Hoan and water, till the marks of the Pumice stone are rubbed out: wash it again, and with a piece of Charcoal without knots (being heat red

hot and quenched in water, the out side being pared off) rub the Plate with water till all the small strokes of the Hoan be vanished: lastly, if yet there remain any small strokes or scratches, rub them out with the end of the burnishing Iron, so shall the Plate be fitted for work.

IV. *To make the hard Varnish for Etching.*

Take Greek or Burgundy Pitch, Colophonium or Rozin, of each five ounces, Nut-oyle four ounces; melt the Pitch and Rozin in an Earthen pot upon a gentle fire; then put in the Oyle, and let them boil for the space of half an hour: Cool it a little upon a softer fire till it appear like a Glewy fyrrup: cool it a little more, strain it, and being almost cold, put it into a Glass bottle for use. Being thus made it will keep at least twenty years.

V. *To make the soft Varnish for Etching.*

Take Virgin-wax three ounces, Mastich in drops two ounces, Asphaltum

one



one ounce : grind the Mastich and Asphaltum severally very fine; then in an Earthen pot melt the Wax, and strew in the Mastich and Asphaltum, stirring all upon the fire till they be well dissolved and mixed, which will be in about half a quarter of an hour; then cooling it a little, pouring it into a basin of fair water (all except the dregs) and with your hands wet (before it is cold) form it into roulds.

*VI. To make the prepared Oyl.*

Take Oyl Olive, make it hot in an Earthen pot, and put into it a sufficient quantity of tried sheeps suet (so much as being dropped upon a cold thing, the oyl may be a little hardened and firm) boil them together for an hour, till they be of a reddish colour, lest they should separate when you use them. This mixture is to make the fat more liquid, and not cool so fast, for the fat alone would be no sooner on the pensil; but it would grow cold; and be sure to put in more oyl in Winter than in Summer.

*VII. To make the Aqua fortis.*

H 4

Take

Take distilled White-wine Vinegar three pints; Sal Armoniack, Bay-salt, of each six ounces: Vertegriese four ounces. Put all together into a large well glazed earthen pot (that they may not boil over) cover the pot close, and put it on a quick fire, and let it speedily boil two or three great walms and no more; when it is ready to boil, uncover the pot, and stir it sometimes with a stick, taking heed that it boil not over: having boiled, take it from the fire, and let it cool being close covered, and when it is cold, put it into a glass bottle with a glass stopple: If it be too strong in Etching, weaken it with a glass or two of the same Vinegar you made it of. There is another sort of Aqua fortis, which is called Common, which is exhibited in *Synopsis Medicinæ, lib. 3. cap. 7. Sect. 4. pag. 656.* But because that Book may not be in every mans hand, we will here insert it; it is thus: Take dried Vitriol two pound; Salt-peter one pound, mix them and distil by a Retort, in open fire by degrees.

VIII. *To make the Etching Needles.*

Chose Needles of several sizes, such as will break without bending, and of a fine grain; then take good round sticks of firm wood (not apt to split) about six inches long, and as thick as a large Goose quill, at the ends of which fix your Needles, so that they may stand out of the sticks about a quarter of an inch or something more.

IX. *To whet the points of the Needles with the Oyl stone.*

If you would have them whetted round, you must whet their points short upon the oyl stone (not as sowing Needles are) turning them round whilst you whet them, as Turners do. If you whet them sloping, first make them blunt upon the oyl stone, then holding them firm and steady, whet them sloping upon one side onely, till they come to a short and roundish oval.

X. The Brush pensil is to cleanse the work, wipe off dust, and to strike the Colours even over the ground or varnish, when laid upon the Plate.

XI. The

XI. The burnisher is a well hardned piece of steel somewhat roundish at the end. Its uses are what we have spoken at the 6 è 1. & 3 è 2.

XII. *To make the frame and trough.*

The frame is an intire board, about whose top and sides is fastned a ledge two Inches broad to keep the *Aqua fortis* from running off from the sides when you pour it on: the lower end of the board must be placed in the trough, leaning sloping against a wall or some other thing, wherein you must fix several pegs of wood to rest the plate upon. The trough is made of a firm piece of Elm or Oak set upon four legs, whose hollow is four Inches wide; and so long as may best fit your use: the hollow must be something deeper in the middle that the water running thither may fall through a hole (there made for that purpose) into an earthen pan well leaded. *The inside of this board and trough must be covered over with a thick oyl colour, to hinder the Aqua fortis from eating or rotting the board.*

CHAP.

## CHAP. VIII.

*The way and manner of using the hard  
varnish.*

**H**AVING well heat the polished plate over a chaffing dish of coals, take some of the first varnish with a little stick, and put a drop of it on the top of your finger, with which lightly touch the plate at equal distances, laying on the varnish equally, and heating the plate again as it grows cold, keeping it carefully from dust or filth; then with the ball of your thumb, tap it upon the plate, till the spots of the varnish are equally spread upon the plate; still wiping your hand over all, to make it more smooth and equal.

*And here beware that neither the varnish be too thick upon the plate, nor your hand sweaty.*

**I**I. Then take a great lighted candle burning clear, with a short snuff, (placing

cing the corner of the plate against a wall) hold the varnished side downward over the candle, as close as you can, so it touch not the varnish, guiding the flame all over, till it is all perfectly black; which you must keep from dust or filth till it is dry.

III. Over a fire of Charcoals hang the varnished plate to dry with the varnish upwards, which will smoak; when the smoak abates, take away the plate, and with a pointed stick scratch near the side thereof, and if the varnish easily comes off, hang it over the fire again a little, so long till the varnish will not too easily come off, then take it from the fire and let it cool.

*If the varnish should be too hard, cast cold water on the back-side of the plate to cool it, that the heat may not make it too hard and brittle. This done,*

IV. Place it upon a low desk, or some such like thing, and cover that part which you do not work on, with a sheet of fine white paper, and over that a sheet of brown paper, on which may rest your hand

hand, to keep it from the varnish.

V. If you use a ruler, lay some part of it upon the paper, that it may not rub off the varnish; and have an especial care that no dust or filth get in between the paper and the varnish, for that will hurt it.

## CH A P. IX.

### *The way and manner of Etching.*

**I**N making lines or hatches, some bigger, some lesser, straight or crooked, you must use several sorts of needles, bigger or lesser as the work requires.

II. The great lines are made by leaning hard on the needle; its point being short and thick, (but a round point will not cut the varnish clear:) or, by making divers lines or hatches, one very close to another, and then by passing over them again with a thicker needle; or, by making them with an indifferent large needle, and letting the *Aqua fortis* lye

lye the longer thereon.

The best needles for this work are such as are whet sloping with an oval, because their sides will cut that which the round ones will not.

III. If your lines or hatches ought to be of an equal thickness from end to end, lean on the needle with an equal force, leaning lightly where you would have the lines or strokes fine or small; and more heavy where you would have the line appear deep or large, thereby the needle may have some Impression in the Copper.

IV. If your lines or hatches be too small, pass over them again with a short round point, of such a bigness as you would have the line of, leaning strongly where you would have the line deep.

V. The manner of holding the needle with Oval points (which are most proper to make large and deep strokes) is much like that of a pen, onely the first side whetted is usually held towards the thumb: but they may be used with



the face of the Oval turned toward the middle finger.

VI. If you would end with a fine stroke, you ought to do that with a very fine needle.

VII. In using the Oval points, hold them as upright and straight in your hand as you can, striking your strokes firmly and freely, for that will add much to their beauty and clearness.

VIII. In Landskip, in places farthest from the sight, as also nearest the light, use a very slender point, leaning so lightly with your hand as to make a small faint stroke.

IX. In working be careful to brush off all the dust which you work off with the needles.

## CH A P. X.

### *Of using the Aqua fortis.*

IF there be any strokes which you would not have the Aqua fortis eat

into ; or any places where the varnish is rubbed off, melt some prepared Oyl, and with a pensil, cover those places pretty thick.

II. Then take a brush, pensil, or rag, and dip it in the prepared oyl, and rub the back side of the plate all over, that the *Aqua fortis* may not hurt it, if by chance any should fall thereon.

III. Before you put the *Aqua fortis* to the plate, gently warm or dry the plate by a fire to dry up the humidity, which it might contract by reason of the Air; and to prevent the breaking up the Varnish upon the first pouring the *Aqua fortis* thereon.

IV. Place the plate by the 128 of this book, and with the *Aqua fortis* in an Earthen pot pour upon the plate, beginning at the top, so moving your hand that it may run all over the plate, which do for eight or ten times: then turn it corner-wise, and pour the *Aqua fortis* on it that way ten or twelve times; and then turn it again corner-wise the other way, pouring on the *Aqua fortis* eight

or ten times as before; doing thus several times for the space of half a quarter of an hour or more, according to the strength of the water, and nature of the Copper.

For there must be less time allowed to hard and brittle Copper for pouring on the Aqua fortis, but more to the soft.

V. But you must have special regard to cast on the Aqua fortis as occasion shall require, and work is; casting it on at several times, and on several places; where you would have it very deep, often; where less deep fewer times: where light, less yet; where lighter, lesser yet: and where so light, as it can scarcely be seen, once or twice: wash it with water, and cover it where you would have it lighter.

VI. Having thus covered your plates as occasion requires; for the second time, place the plate on the frame as aforesaid, and pour on it your Aqua fortis for a full half hour.

VII. Then wash it with water and dry it, covering the places which require

quire lightness or faintness (that they may be proportionable to the design) then pour on the *Aqua fortis* for the last time more or less according to the nature of your work, and the deepness that it requires.

VIII. You may rub off the Varnish or Ground, as occasion in your work requires with a Charcoal, to see whether the water hath eaten deep enough; by which you may judge of the space of time, that you are after to employ in pouring on the *Aqua fortis*, in the works you will have to do, which if the shadows require much depth, ought to be very black, the water ought to be poured on (at the last time) for an hour or better; yet know no certain rule of time can be limited for this.

## CHAP. XI.

*Of Finishing the Work.*

**I** **A**LL the former operations being done, wash the Plate with fair water; and put it wet upon the fire, till the mixture be well melted, and then wipe it very clean on both sides with a linnen cloth, till you have cleansed it of all the mixture.

**II.** Take Charcoal of Willow, take off the rind of it, and putting fair water on the Plate, rub it with the Charcoal, as if you were to polish it, and it will take off the Varnish.

Where note, that the Coal must be free from all knots and roughness, and that no sand or filth fall upon the Plate.

**III.** Take ordinary Aqua fortis, to which add two third parts of water, and with some linnen rags dyed therein, rub the Plate all over, so will you take away its discolouring, and recover its former beauty.

I 2

IV. Then

IV. Then take drie linnen rags, and wipe the Plate so as to take off all the aforesaid water, and then holding it a little to the fire, put upon it a little oyl olive, and with a piece of an old Beaver rolled up rub the Plate well all over, and lastly wipe it well with a drie cloth.

V. Then if any places need touching with the Graver, as sometimes it happens, especially where it is to be very deep or black, perfect them with care; which done, the Plate is ready for the Rolling Press.

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## CHAP. XII.

### *The way of using the soft Varnish.*

I. **T**HE Plate being prepared by cleansing it with a Charcoal and clean water, wash it well and drie it, then with fine white Chalk scraped and a fine rag, rub it well over, not touching it with your fingers.

II. Lay

II. Lay down your Plate over a Chafing-dish of Small coal, yet so as the fire may have air; then take the Ground or soft Varnish (it being tyed up in a fine rag) and rub it up and down the Copper, so as it may sufficiently cover it, (not too thin nor too thick:) then take a feather and smooth it as well as possibly you can all one way, and then cross it, till it lie very well.

*But you must take heed that the Plate be not too hot, for if it lie till the Ground smokes, the moisture will be dried up, and that will spoil the work, and make the Ground break or fly up.*

III. Then grind some white Lead with Gum water, so that it may be of a convenient thickness to spread on the Copper; and with a large pensil, or small brush, strike the Plate cross over, twice or thrice till it is smooth; and then with a larger brush (made of Squirrels tails) gently smooth the white, and then let it lie till it is drie.

IV. Or you may black the Varnish with a candle, as we taught at the 2.<sup>e</sup>.8.

and then warm it over the fire, till the Varnish begins to melt.

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## CHAP. XIII.

*The way of Etching upon the soft Varnish.*

I. **T**HE way of Etching is the same with that in the hard Varnish; only you must be careful not to hurt your Varnish, which you may do by placing on the sides of your Plate two little boards, and laying cross over them another thin one, so as that it may not touch the Plate, on which you must rest your hand whilst you work.

II. Then place the Plate on a Desk (if you so please) for by that means the superfluous matter will fall away of it self.

III. But if you have any design to transfer upon the Plate from any Copy or Print, scrape on the backside thereof some red Chalk all over; then go over that



that, by scraping some soft Charcoal; till it mingle with the Chalk; and with a large stiff pensil rub it all over till it be fine and eaven, and so lay down the design upon the Plate, and with a blunt Needle draw over the out strokes: *and as you work, you need not scratch hard into the Copper, only so as you may see the Needle go through the Varnish to the Copper.*

IV. Always be sure, when you leave the work, to wrap the Plate up in Paper, to keep it from hurt, and corrupting in the air, which may drie the Varnish: and in Winter time wrap the Plate up in a piece of woollen, as well as paper; for if the frost get to it, it will cause the Varnish to rise from the Copper in the eating.

*An inconveniency also will accrew, by letting the Varnish lie too long upon the Plate before the work is finished; for three or four months will consume the moisture, and so spoil all.*

V. The marking of the design upon the soft Varnish, is best done with black

Lead or Chalk, if the ground is white; but with red Chalk, if the ground is black.

VL Having graved what you intend upon the Varnish, take some fair water, a little warm, and cast it upon the Plate; and then with a soft clean Sponge, rub upon the white Lead to moisten it all over; and then wash the Plate to take away the whiting, and drie it.

VII. Or lastly, with Aqua fortis mixed with fair water, wash it all over, and by this means you may take away the whiting; which then wash with common water, and drie it; and thus have you the Plate prepared for the Aqua fortis.

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## CHAP. XIV.

*Of Using the Aqua fortis, and finishing the work.*

I. **P**UT soft Wax (red or green) round the brims of the Plate, and let it be

beraised above the Varnish about half a Barly corns length; so that placing the Plate level, the water being powred upon the Plate may by this means be retained. This done,

II. Take common *Aqua fortis* six ounces, Common water two ounces; mix them, and pour it gently upon the Plate, so that it may cover it fully all over; so will the stronger hatchings be full of bubbles, while the fainter will appear clear for a while, not making any sudden operations to the view.

III. When you perceive the water to operate a small time, pour it off into a glazed earthen dish, and throw fair water upon the Plate, to wash away the *Aqua fortis*, then dry the Plate: and where you would have the Cut to be faint, tender or sweet, cover it with the prepared Oil, and then cover the Plate again with *Aqua fortis* as before, leaving it on for eight or ten minutes, or longer: then put off the *Aqua fortis* as before, washing and drying the Plate, and covering with the prepared

pared Oyl other places which you would not have so deep as the rest: Lastly put on the Aqua fortis again, for the space of half an hour (more or less) and then pour it off washing the Plate with fair water as before.

*As you would have your lines or strokes to be deeper and deeper, so cover the sweeter or fainter parts by degrees with the prepared oyl, that the Aqua fortis may lie the longer on the deep strokes. Then*

I V. Take off the border of Wax, and heat the Plate so that the Oyl and Varnish may thoroughly melt; which wipe away well with a linnen cloth: then rub the Plate over with oyl Olive and a piece of an old beaver roll'd up, which done, touch it with the Graver where need is.

V. But if any thing be (at last) forgotten; then rub the Plate aforesaid with crums of bread, so well that no filth or oyl remain upon the Plate.

VI. Then heat the Plate upon a Charcoal fire, and spread the soft Varnish with a feather upon it (as before) so

that

that the hatchings may be filled with Varnish; black it, and then touch it over again, or add what you intend.

VII. Let your hatchings be made by means of the Needles, according as the manner of the work shall require, being careful before you put on the Aqua fortis, to cover the first graving on the Plate with the prepared Oyl (lest the Varnish should not have covered all over:) then cause the *Aqua fortis* to eat into the work, and lastly cleanse the Plate as before.

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## CHAP. XV.

*Of Limning and the Materials thereof.*

I. Limning is an Art whereby in water Colours, we strive to resemble Nature in every thing to the life.

II. The Instruments and Materials thereof are chiefly these. 1. *Gums*. 2. *Colours*. 3. *Liquid Gold and Silver*. 4. *The Grindstone and Muller*. 5. *Pencils*. 6. *Tables*.

6. *Tables to Limn in.* 7. *Little glass or China dishes.*

III. The *Gums* are chiefly these four, Gum Arabick, Gum Lake, Gum Hedera, Gum Armoniack.

IV. The principal *Colours* are these seven, *White, Black, Red, Green, Yellow, Blew, Brown* : out of which are made mixt or compound *Colours*.

V. The *Liquid Gold and Silver* is either the natural or artificial.

The natural is that which is produced of the *Metals* themselves : the Artificial is that which is formed of other colours.

VI. The *Grinding stone, Muller, Pencils, Tables, and Shells or little China dishes* are only the necessary instruments and attendants, which belong to the practice of Limning.

## C H A P. XVI.

*Of the Gumms and their Use.*

I. **T**He chief of all is *Gum-Arabick*, that which is white, clear and brittle; the Gum-water of it is made thus:

Take *Gum Arabick*, bruise it and tie it up in a fine clean linnen cloath, and put it into a convenient quantity of pure spring water, in a glass or earthen vessel; letting the Gum remain there till it is dissolved; which done, if the water is not stiff enough, put more gum into the cloath; but if too stiff, add more water: of which Gum-water have two sorts by you, the one strong, the other weak; of which you may make a third at pleasure.

II. *Gum-lake*; it is made of whites of Eggs beaten and strained, a pint; Honey, Gum-hedera of each 2 Drachmes, strong wort four Spoonfuls, mix them, and strain them with a piece of sponge till they run like

like a clear oyl, which keep in a clean vessel till it grows hard.

*This gum will resolve in water like gum Arabick, of which gum water is made in like manner; it is a good ordinary varnish for pictures.*

III. *Gum Hedera*, or gum of Ivy; it is gotten out of Ivy, by cutting with an Axe a great branch thereof, climbing upon an Oak-tree, and bruising the ends of it with the head of the Axe; at a months end, or thereabouts you may take from it a very clear, pure and fine gum, like oyl.

*It is good to put into gold size and other colours, for these three reasons: 1. It abates the ill scent of the size: 2. It will prevent bubbles in gold size and other colours: 3. Lastly, it takes the fat and clamminess off colours: besides which it is of use in making pomanders.*

IV. *Gum Armoniacum*, It is a forreign gum, and ought to be bought strained. Grind it very fine with juyce of Garlick and a little gum Arabick water, so that it may not be too thick, but that you may write



write with it what you will :

When you use it, draw what you will with it, and let it dry; and when you gild upon it, cut your Gold or Silver, to the fashion which you drew with the size or gum; then breath upon the size, and lay the Gold upon it gently taken up, which press down hard with a piece of wool; and then let it well dry; being dried, with a fine linnen cloath strike off the loose gold; so will what was drawn be fairly gilded if it was as fine as a hair: it is called Gold Armo-niack.

## CHAP. XVII.

*Of the seven Colours in General.*

I. **T**He chief WHITES are these, Spodium, Ceruse, White-lead, Spanish-white, Eg-shells burnt. This Colour is called in Greek λευκος of λευκω, video, to see, because λευκότης ἐστὶ δακτυλίου ὁ λευκός, whiteness (as Aristotle said) is the object of sight, in Latine Albus, from

from whence the Alps had their name, by reason of their continual whiteness with snow. The Spanish-white is thus made. Take fine chalk three Ounces. Alom one Ounce, grind them together with fair water, till it be like pap; roul it up into balls, which dry leisurely: then put them into the fire till they are red hot; take them out, and let them cool: it is the best white of all, to garnish with, being ground with weak gum-water.

II. The chief BLACKS are these. Hartshorn burnt, Ivory burnt, Cherry-stones burnt, Lamp-black, Charcoal.

Black, in Latine Niger is so called from the Greek word *νεκρος*, which signifies dead, because putrified and dead things are generally of that colour. Lamp-black is the smoak of a Link, Torch or Lamp gathered together.

III. The chief REDS are these. Vermilion, Red-lead, Indian-lake, Red-oker. It is called in Latine Ruber *magis rubeus à corticibus vel granis pomorum granates*; from the Rinds or Seeds of Pomgranates, as Scaliger saith.

IV. T

IV. The chief GREENS are these: Green Bice, Verdegriese, Verditure, Sappgreen. This colour is called in Latine Viridis from Vires: in Greek  $\chi\lambda\alpha\delta\rho$  à  $\chi\lambda\omicron\nu$ , Grass or Green herb, which is of this Colour.

V. The chief YELLOWS are these: Orpiment, Masticot, Saffron, Pink yellow, Oker de luce. This colour is called in Latine Flavus, Luteus; in Greek  $\chi\alpha\rho\delta\epsilon$ , which is Homer's Epithite for Menelaus, where he calls him  $\chi\alpha\rho\delta\epsilon$   $\mu\epsilon\nu\epsilon\lambda\alpha\omicron\varsigma$ .

VI. The chief BLEWS are Ultramarine, Indico, Smalt, Blew bice. This colour is called in Latine Caruleus, in Greek  $\kappa\upsilon\alpha\rho\epsilon$  à  $\kappa\upsilon\alpha\rho\epsilon$ , the name of a stone, which yields Ultramarine.

VII. The chiefest BROWNS are Umber, Spanish-brown, Colen's Earth. It is called in Latine Fuscus, quasi  $\phi\upsilon\sigma\kappa\alpha\mu$ , from darkening the light, in Greek  $\phi\alpha\upsilon\varsigma$ .

## C H A P. XVIII.

*Of Colours in Particular.*

I. *Ceruse*, Grind it with glair of Eggs and it will make a most perfect white.

II. *White-lead*, Grind it with a weak water of gum-lake and let it stand three or four days, after which if you mix with it Roset and Vermilion, it makes a fair *Carnation*.

III. *Spanish-white*, It is the best white of all, to garnish with, ground with weak Gum-water.

IV. *Lamp-black*, ground with Gum-water, it makes a good black.

V. *Vermilion*, Grind it with the glair of an Egg, and in the grinding put a little clarified honey, to make its colour bright and perfect.

VI. *Sinaper-lake*, it makes a deep and beautiful red, or rather purple, most like unto a Red-rose. Grind it with Gum

gum-Lake and Turnsole water: if you will have it light, add a little Ceruse, and it will make it a bright Crimson; if to diaper, add only Turnsole water.

VII. *Red Lead*, Grind it with some Saffron, and stiff gum-Lake; for the Saffron makes it orient, and of a Marigold colour.

VIII. *Turnsole*, Lay it in a Sawcer of Vinegar, and set it over a chafing dish of coals; let it boil, then take it off, and wring it into a Shell, adding a little gum Arabick, let it stand till it is dissolved: It is good to shadow Carnation, and all Yellows.

IX. *Roset*, Grind it with brazil water, and it will make a deep purple: put Ceruse to it, and it will be lighter: grind it with Litmose, and it will make a fair Violet.

X. *Spanish brown*, Grind it with Brazil water: mingle it with Ceruse and it makes a horse flesh Colour.

XI. *Bole Armoniack*, It is a faint Colour; its chief use is, in making size for burnish'd gold.

XII. *Green bice*, Order it as you do blew bice; when it is moyst, and not through dry, you may diaper upon it with the water of deep green.

XIII. *Verdegreife*, Grind it with juyce of Rue, and a little weak gum water, and you will have a most pure green: if you will diaper with it, grind it with Lye of Rue (or else the decoction thereof) and there will be a hoary green: diaper upon Verdegrieise green with sap green.

XIV. *Verditure*, grind it with a weak gum Arabick water: it is the faintest green that is, but is good to lay upon black, in any kind of drapery.

XV. *Sap-green*, lay it in sharp vinegar all night; put it into a little Alome to raise its colour, and you will have a good green to diaper upon other greens.

XVI. *Orpiment*, *Arfenicum* or *Antipigmentum*, grind it with a stiff water of gum Lake, because it is the best colour of it self; it will lye upon no green, for all greens, white and red lead, and Co-

ruse

use stain it: wherefore you must deepen your colours so that the Orpiment may be highest, and so it may agree with all Colours.

XVII. *Masticat*, Grind it with a small quantity of Saffron in gum water, and never make it lighter than it is: it will endure to lie upon all colours and metals.

XVIII. *Saffron*, Steep it in Glair: it may be ground with Vermilion.

XIX. *Pink-yellow*, If you would have it sad coloured, grind it with Saffron: if light, with Ceruse: mix it with weak gum water, and so use it.

XX. *Oker de Luce*, Grind it with pure Brazil water: it makes a passing hair colour; and is a natural shadow for gold.

XXI. *Umber*, It is a more sad colour. Grind it with gum water, or gum Lake; and lighten it (if you please) with a little Ceruse and a blade of Saffron.

XXII. *Ultramarine*, If you would have it deep, grind it with Litmose water; but if light with fine Ceruse,

and a weak gum Arabick water.

XXIII. *Indico*, Grind it with water of Gum Arabick, as Ultramarine.

XXIV. *Blew bice*, Grind it with clean water, as small as you can, then put it into a shell, and wash it thus: put as much water to it as will fill up the vessel or shell, and stir it well, let it stand an hour, and the filth and dirty water cast away; then put in more clean water, do thus four or five times, and at last put in Gum Arabick water somewhat weak, that the Bice may fall to the bottom; pour off the gum water, and put more to it, wash it again, drie it, and mix it with weak gum water (if you would have it rise of the same colour) but with a stiff water of gum Lake, if you would have a most perfect blew; if a light blew, grind it with a little Ceruse; but if a most deep blew, add water of Litmose.

XXV. *Smalt*, Grind it with a little fine Roset, and it will make a deep violet: and by putting in a quantity of Ceruse



Ceruse, it will make a light Violet.

XXVI. *Litmose. blew*, Grind it with Ceruse: with too much Litmose it makes a deep blew: with too much Ceruse, a light blew; grind it with the weak water of gum Arabick.

Take fine Litmose, cut it in pieces, lay it in weak water of Gum Lake for twenty four hours, and you shall have a water of a most perfect Azure; with which water you may dye Paper and Damask, upon all other blews, to make them shew more fair and beautiful.

XXVII. *Orchal*, Grind it with unslak'd Lime and Urine, it makes a pure Violet: by putting to more or less Lime, you may make the Violet light or deep as you please.

## CHAP. XIX.

*Of Mixt and Compound Colours.*

I. **M**urry, It is a wonderful beautiful colour, composed of purple and white : it is made thus. Take *Sinaper* lake two ounces ; *white Lead* one ounce, grind them together.

II. *A glass Grey*, Mingle *Oeruse* with a little *Azure*.

III. *A Bay colour*, Mingle *Vermilion* with a little *Spanish brown* and *black*.

IV. *A deep Purple*, It is made of *Indico*, *Spanish brown* and *white*.

*It is called in Latin Purpureus, in Greek πορφυρεος from πορφυρα, a kind of shell fish that yield a liquour of that colour.*

V. *An Ash colour, or Grey*, It is made by mixing *white* and *lamp black* ; or *white* with *Sinaper*, *Indico* and *black* make an *Ash colour*.

*It is called in Latin Cæsius, and color Cinerius ; in Greek γλαυκός and πορφιδης.*

VI. *Light*

VI. *Light Green*, It is made of Pink and Smalt ; with white to make it lighter if need require.

VII. *Saffron colour*, It is made of Saffron alone by infusion.

VIII. *Flame colour*, It is made of Vermilion and Orpiment, mixed deep or light at pleasure : or thus. Take red Lead and mix it with Masticot, which heighten with white.

IX. *A Violet colour*, Indico, white and Sinaper Lake make a good Violet. So also Ceruse and Litmose, of each equal parts.

X. *Lead colour*, It is made of White mixed with Indico.

XI. *Scarlet colour*, It is made of Red Lead, Lake, Vermilion : yet Vermilion in this case is not very useful.

CHAP.

## C H A P. XX.

## Of Colours for Drapery.

I. **F**OR Yellow garments. Take Masticot deepned with brown Oker and red Lead.

II. *For Scarlet.* Take vermilion deepned with Sinaper lake; and heightened with touches of Masticot.

III. *For Crimson.* Lay on Lake very thin, and deepen with the same.

IV. *For Purple.* Grind Lake and Smalt together; or take blew Bice, and mixt with red and white Lead.

V. *For an Orient Violet.* Grind Libmose, blew Smalt, and Ceruse; but in mixture let the blew have the upper hand.

VI. *For Blew.* Take Azure deepned with Indie blew; or Lake heightened with white.

VII. *For black Velvet.* Lay the garment first over with Ivory black, then heighten

heighten it with Cherrystone black, and a little white.

VIII. *For black Sattin.* Take Cherrystone black; then white deepned with Cherrystone black; and then lastly, Ivory black.

IX. *For a pure Green.* Take Verdegriese, bruile it, and steep it in Muscadine for twelve hours, then strain it into a shell, to which add a little Sap green: (but put no gum thereto.)

X. *For a Carnation.* Grind Ceruse, well washed with red Lead; or Ceruse and Vermilion.

XI. *For Cloth of Gold.* Take brown Oker, and liquid Gold water, and heighten upon the same with small strokes of gold.

XII. *For white Sattin.* Take first fine Ceruse, which deepen with Cherryston black; then heighten again with Ceruse, and fine touches where the light falleth.

XIII. *For a russet Sattin.* Take Indiblew and Lake, first thin, and then deepned with Indie again.

XIV. *For*

XIV. *For a hair Colour.* It is made out of Masticot, Umber, yellow Oker, Ceruse, Oker de Rous, and Sea-coal.

XV. *For a Popinjay green.* Take a perfect green mingled with Masticot.

XVI. *For changeable Silk.* Take water of Masticot and red Lead; which deepen with Sap green.

XVII. *For a light Blew.* Take blew Bice, heightened with Ceruse or Spodium.

XVIII. *For to shadow Russet.* Take Cherrystone black, and white; lay a light russet, then shadow it with white.

XIX. *For a Skie colour.* Take blew Bice and Venice Ceruse; but if you would have it dark, take some blew and white.

XX. *For a Straw colour.* Take Masticot, then white heightened with Masticot, and deepned with Pink, or thus. Take red Lead deepned with Lake.

XXI. *For Yellowish.* Thin Pink deepned with pink and green; Orpiment burned makes a Marrigold colour.

XXII. *For*

XXII. *For a Peach colour.* Take Brazil water, Log water and Ceruse.

XXIII. *For a light Purple.* Mingle Ceruse with Logwood water: or take Turnsole mingled with a little Lake, Smalt and Bice.

XXIV. *For a Walnut colour.* Red Lead thinly laid, and shadowed with Spanish brown.

XXV. *For a Fire colour.* Take Masticot, and deepen it with Masticot for the flame.

XXVI. *For a Tree.* Take Umber and white, wrought with Umber, deepned with black.

XXVII. *For the Leaves.* Take Sap green and green Bice, heighten it with Verditure and white.

XXVIII. *For Water.* Blew and white, deepned with blew, and heightned with white.

XXIX. *For Banks.* Thin Umber, deepned with Umber and black.

XXX. *For Feathers.* Take Lake frizled with red Lead.

## C H A P. XXI.

*Of Liquid Gold and Silver.***I.** *Liquid Gold or Silver.*

**L** Take five or six leayes of Gold or Silver, which grind (with a stiff gum lake water, and a good quantity of salt) as small as you can; then put it into a vial or glassed vessel; add so much fair water as may dissolve the stiff gum water; then let it stand four hours, that the gold may settle: decant the water, and put in more, till the gold is clean washed: to the gold put more fair water, a little sal Armoniack and common salt, digesting it close for four days: then put all into a piece of thin Glovers leather (whose grain is peeled off) and hang it up, so will the sal Armoniack fret away, and the gold remain behind which keep.

*When you use it, temper it with glair of eggs, and so use it with pen or pensil. Glair*



of Eggs is thus made. Take the whites and beat them with a spoon, till that rise all in a foam; then let them stand all night, and by morning they will be turned into clear water, which is good glair.

## II. *Argentum Muscum.*

Take one ounce of tin, melt it, and put thereto of Tartar and Quicksilver of each one ounce, stir them well together until they be cold, then beat it in a mortar and grind it on a stone; mix it with gum water, write therewith, and afterwards polish it.

## III. *Burnished Gold or Silver.*

Take gum-lake and dissolve it into a stiff water; then grind a blade or two of Saffron therewith and you shall have a fair gold: when you have set it, being thoroughly dry, burnish it with a dogs tooth. Or thus, having writ with your pen or pencil what you please, cut the leaf Gold or Silver into pieces, according to the draught, which take up with a feather and lay it upon the drawing, which press down with a piece of wool; and being dry, burnish it.

## IV. *Gold*

IV. *Gold Armoniack.*

This is nothing but that which we have taught at the 4<sup>e</sup> 16 of this Book.

V. *Size for burnished Gold.*

Take Bole Armoniack 3 drachms, fine Chalk 1 drachm; grind them as small as you can together with fair water, three or four times, letting it dry after every time: then take glair and strain it as short as water, with which grind the Bole and Chalk, adding a little gum Hedera, and a few blades of Saffron: grind all as small as possible, and put them into an Ox horn (I judge a glass vessel better) and set it to rot in horse dung for six weeks; then take it up, and let it have air, and keep it for use.

Its use is for gilding parchments, book covers, and leather, thus: lay this size first upon the parchment, then with a feather lay the Gold or Silver upon it, which when dry, burnish it.

VI. *To Diaper on Gold or Silver.*

You must diaper on gold with lake  
and

and yellow Oker: But upon Silver with Ceruse.

VII. *Aurum Musicum:*

Take fine Crystal, Orpiment of each one ounce, beat each severally into a fine powder, then grind them together well with glair.

You may write with it, with pen or pencil, and your letters or draught will be of a good gold colour.

C H A P. XXII.

*Of Preparing the Colours.*

**C**olours according to their natures, have each a particular way of preparation: to wit, by grinding, washing, or steeping.

I. The chief Colours to be ground are these; White lead, Ceruse, Sinaper lake, Oker, Pink; Indico, Umber, Colens Earth, Spanish Brown, Ivory Black, Chrysstone Black.

III. The chief colours to be wash'd  
L are,

are, Red lead, Masticot, green Bice, Cedar green, Ultramarine, blew Bice, Smalt, Verditure.

I V. The chief *colours to be steeped*, are Sap-green, Saffron, Turnsole, Stone blew, Venice berries.

V. *To Grind Colours.*

Take the colour you would grind, and scrape off from it all the filth, then lay it upon the stone and with the muller bruise it a little; then put thereto a little spring water, and grind all together very well, till the colour is very fine; which done, pour it out into certain hollows or furrows, cut in chalk-stone, and there let it lye till it is dry, which reserve in papers or glasses.

VI. *To wash Colours.*

Put the colour into a glased vessel, and put thereto fair water plentifully, wash it well, and decant (after a while) the water; do this six or seven times; last put the water (being just troubled) into another glased vessel, leaving the dregs at bottom: then into this second vessel put more fair water, washing it a

before, till the water (being settled) be clear, and the colour remain fine at bottom: we have taught another way at the 24 & 18 of this Book.

**VII. To steep Colours.**

Take a quantity thereof, and put it into a shell, and fill the shell with fair water, to which adde some fine powder of Alom, to raise the Colour; let it thus steep a day and night, and you will have a good colour.

*Where note; Saffron steeped in vinegar gives a good colour; and the Venice berries in fair water and a little Alom, or a drop or two of oyl of Vitriol makes a fair yellow.*

**VIII. To temper the Colours.**

Take a little of any colour, and put it into a clean shell, and adde thereto a few drops of gum water, and with your finework it about the shell, then let it dry; when dry, touch it with your finework, if any colour comes off, you must adde stronger gum water: but being dry, if the colour glister or shine, it is a sign there is too much gum in it,

which you may remedy by putting in fair water.

*IX. To help the defects.*

Some colours as Lake, Umber, and others which are hard, will crack when they are dry; in this case, in tempering them adde a little white Sugar candy in very fine powder, which mix with the colour and fair water in the shell, till the Sugar candy is dissolved.

X. These colours, Umber, Spanish brown, Colen earth, Cherrystone, and Ivory black, are to be burnt before they be ground or wash'd.

*XI. To burn or calcine Colours.*

This is done in a crucible, covering the mouth thereof with clay, and setting it in a hot fire, till you are sure it is red hot through: which done, being cold, wash or grind it as aforesaid.

*XII. To prepare shadows for Colours.*

White is shaded with black, and contrariwise: yellow with Umber, and the Okers: Vermilion with Lake: blew Bice with Indie: Black coal with Rose, &c.

## C H A P. XXIII.

*Of the Manual Instruments.*

**I.** The manual Instruments are four, (by the 2<sup>e</sup> & 15 of this Book) to wit, The grinding stone and Muller; Pensils; Tables to Limn on; and shells or little glasses or China dishes.

**II.** The grinding stone may be of Porphury, Serpentine, or Marble, but rather a Pebble, for that is the best of all others: the muller only of pebble, which keep very clean.

*These may be easily got of Marblers or Stone-cutters in London.*

**III.** Choose your pensils thus: by their fastness in the quills, and their sharp points after you have drawn or wetted them in your mouth two or three times; so that although larger yet their points will come to as small as a hair, which then are good; but if they spread or have any extravagant hairs they are naught.

IV. *To wash your Pensils.*

After using them, rub the ends of them well with soap, then lay them a while in warm water to steep, then take them out and wash them well in other fair water.

V. *To prepare the Table.*

It must be made of pure fine paste-board, such as Cards are made of (of what thickness you please) very finely slick'd and glazed. Take a piece of this paste-board of the bigness you intend the picture, and a piece of the finest and whitest parchment you can get (virgin-parchment) which cut of equal bigness with the paste-board; with thin, white, new made starch, paste the parchment to the paste-board, with the outside of the skin outwardmost: lay on the starch very thin and eaven; then the grinding stone (being clean) lay the card thereon with the parchment side downwards, and as hard as you can, rub the other side of the paste-board with a Boars tooth set in a stick; then let it be thorow drie, and it will be

fit



fit to work or limn any curious thing upon.

VI. The shells holding or containing your colours, ought to be Horse-muscle shells, which may be got in July about Rivers sides; but the next to these are small muscle shells, or in stead thereof little China or glass vessels.

## CHAP. XXIV.

### *Of Preparations for Limning.*

**H**Ave two small glass or China dishes, in either of which must be pure clean water, the one to wash the pencils in being foul; the other to temper the colours with when there is occasion.

II. Besides the pencils you Limn with; a large, clean, and dry pencil, to cleanse the work from any kind of dust, that may fall upon it, which one called Fitch-Pencils.

III. A sharp Pen-knife to take off  
L 4 hairs

hairs that may come from your pencil, either among the colours or upon the work ; or to take out spots that may fall upon the card, or table.

IV. A Paper with a hole cut therein, to lay over the Card, to keep it from dust and filth, to rest your hand upon, and to keep the soil and sweat of your hand from sullyng the parchment, as also to try your pencils on before you use them.

*Let the small glassses, waters, pencils, and pen-knife lie all on the right hand.*

V. Have ready a quantity of light carnation or flesh colour temper'd up in a shell by it self with a weak gum water; If it be a fair complexion mix white and red Lead together ; if a brown or swarthy, add to the former, Masticot, or English Oker, or both : but be sure the flesh colour be always lighter than the complexion you would limne ; for by working on it you may bring it to its true colour.

VI. In a large Horse-muscle shell place your severall shadows ( for the flesh

flesh colour) in little places one distinct from another.

VII. In all shadowings have ready some white, and lay a good quantity of it by it self, besides what the shadows are first mixed with; for red for the cheeks and lips, temper Lake and red Lead together: for blew shadows (as under the eyes and in veins) Indico or Ultramarine and white: for gray faint shadows, white, English Oker, sometimes Masticot: for deep shadows, white, English oker, Umber: for dark shadows, Lake and Pink, which make a good fleshy shadow.

VIII. To make choice of the light.

*Let it be fair and large, and free from shadows of trees or houses, but all clear skie light, and let it be direct from above, and not transverse; let it be northerly and not southerly; and let the room be close and clean, and free from the Sun-beams.*

IX. Of the manner of sitting.

*Let your desk on which you work be so situate, that sitting before it, your left arm may be towards the light, that the*  
light

light may strike sidling upon your work. Let the party that is to be Limned, be in what posture themselves will design, but not above two yards off you at most, and level with you; wherein observe their motion, if never so small, for the least motion, if not recalled, may in short time bring on you many errors: Lastly, the face being finished, let the party stand, (not sit) at a farther distance (four or five yards off) to draw the posture of his clothes.

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## CHAP. XXV.

*Of the Practice of Limning in Miniature, or Drawing of a Face in Colours.*

I. **T**O begin the work.

Have all things in a readiness (as before) then on the Card lay the prepared colour (answerable to the complexion presented) even and thin, free from hairs and spots, over the place where the picture is to be: the ground thus laid, begin the work, the party being

being set, which must be done at three sittings: at the first sitting the face is only dead coloured, which takes up about two hours time: at the second sitting, go over the work more curiously, adding its particular graces or deformities, sweetly couching the colours, which will take up about five hours time: at the third sitting finish the face, in which you must perfect all that is imperfect and rough, putting the deep shadows in the face, as in the eyes, eyebrows, and ears, which are the last of the work, and not to be done till the hair curtain, or back side of the picture, and the drapery be wholly finished.

*II. The operation or work at first sitting.*

The ground for the complexion being laid, draw the out-lines of the face, which do with Lake and white mingled; draw faintly, that if you miss in proportion or colour you may alter it: this done, add to the former colour red Lead, for the cheeks and lips; let it be but faint (for you cannot lighten

ten a deep colour) and make the shadows in their due places, as in the cheeks, lips, tip of the chin and ears, the eyes and roots of the hair: shadow not with a flat pencil, but by small touches (as in hatching) and to go over the face. In this dead covering rather than to be curious, strive as near as may be to imitate nature. The red shadows being put in their due places, shadow with a faint blew, about the corners and balls of the eyes; and with a grayish blew under the eyes and about the temples, heightning the shadows as the light falls, as also the harder shadows in the dark side of the face, under the eyebrows, chin, and neck. Bring all the work to an equality, but add perfection to no particular part at this time; but imitate the life in likeness, roundness, boldness, posture, colour, and the like. Lastly, touch at the hair with a suitable colour in such curls, folds, and form, as may either agree with the life, or grace the picture; fill the empty places

places with colour, and deepen it more strongly, than in the deepest shadowed before.

III. *The operation or work at second sitting.*

As before rudely, so now you must sweeten those varieties which Nature affords, with the same colours and in the same places, driving them one into another, yet so as that no lump or spot of colour, or rough edge may appear in the whole work; and this must be done with a penfil sharper than that which was used before. This done, go to the back side of the picture, which may be Landskip; or a curtain of blew or red Sattin: if of blew, temper as much Bice as will cover a Card, and let it be well mix'd with gum; with a penfil draw the out line of the Curtain; as also of the whole picture; then with a large penfil lay thinly or airily over the whole ground, on which you mean to lay the blew; and then with a large penfil, lay over the same a substantial body of colour; in doing of which

which, be nimble, keeping the colour moist, letting no part thereof be dry till the whole be covered. If the Curtain be crimson, trace it out with lake; lay the ground with a thin colour; and lay the light with a thin and watery colour, where they fall; and while the ground is yet wet, with a strong dark colour tempered something thick, lay the strong and hard shadows close by the other lights. Then lay the linnen with faint white, and the drapery flat of the colour you intend it. In the face see what shadows are too light or too deep, for the curtain behind, and drapery, and reduce each to their due perfection; draw the lines of the eye-lids, and shadow the entrance into the ear, deepness of the eye-brows, and eminent marks in the face, with a very sharp pencil: lastly go over the hair, colouring it as it appears in the life, casting over the ground some loose hairs, which will make the picture stand as if were at a distance from the curtain. *Shadow the linnen with white, black,*  
and



and a little yellow and blem; and deepen  
your black with Ivory black, mix'd with a  
little Lake and Indico.

IV. The operation or work at third  
limning.

This third work is wholly spent in  
giving strong touches where you see  
cause; in rounding, smoothing and co-  
louring the face, which you may better  
leave to do, now the curtain and drapery  
is limned, than before. And now ob-  
serve whatsoever may conduce to the  
perfection of your work, as gesture,  
stars or moles, casts of the eyes, wind-  
ings of the mouth, and the like.

## CHAP. XXVI.

### Of Limning Drapery.

A Full and substantial ground be-  
ing laid all over where you in-  
tend the drapery; as if blew, with Bice  
smoothly laid, deepen it with Lake and  
Indico; lightning it with a fine faint  
white

white, in the extreme light places, the which understand of other colours.

II. If the body you draw be in *Armour*, lay liquid silver all over for a ground, well dried and burnished; shadow it with Silver, Indigo and Umber, according as the life directs you.

III. For *Gold Armour*, lay liquid gold as you did the silver, and shadow upon it with Lake, English Oker, and a little gold.

IV. For *Pearls*, your ground must be Indigo and white; the shadows black and pink.

V. For *Diamonds*, lay a ground of liquid silver, and deepen it with Cherry-stone and Ivory black.

## CHAP. XXVII.

## Of Limning Landskip.

**A**Ll the variable expressions of Landskip are innumerable, they being as many as there are men and fancies; the general rules follow.

I. Always begin with the Sky, Sunbeams, or lightest parts first; next the yellowish beams (which make of Maffiot and white) next the blewness of the Skie, (which make of Smalt on-ly.)

II. At first colouring, leave no part of the ground uncovered, but lay the colours smooth all over.

III. Work the Sky downwards: towards the Horizon fainter and fainter, as it draws nearer and nearer the earth: the tops of mountains far remote, work so faint that they may appear as lost in the air.

IV. Let places low, and near the  
M ground

ground be of the colour of the earth, of a dark yellowish, or brown green; the next lighter green; and so successively as they lose in distance, let them abate in Colour.

V. Make nothing which you see at a distance perfect, by expressing any particular sign which it hath, but express it in colours, as weakly and faintly, as the eye judgeth of it.

VI. Always place light against darkness and darkness against light, by which means you may extend the prospect as very far off.

VII. Lastly, Let all shadows lose their force as they remove from the eye; always letting the strongest shadow be nearest hand.

POLY

## POLYGRAPHICES

*Liber Tertius.*

Of Painting, Washing, Colouring,  
Dying and Varnishing.

*Containing the description and use of all the  
chief Instruments & materials; the way  
and manner of working, together with  
the beginning, progress and end thereof.*

Exemplified in the Painting of the An-  
tients: the washing of Maps, Globes or  
Pictures: dying of Cloaths, Silks,  
Horns, Bones, Woods, Glass, Stones  
and Metals: Together with the var-  
nishing thereof, according to any  
purpose or intent.

## C H A P. I.

*Painting in Oyl, & the Materials thereof.*

Painting in Oyl is nothing but the  
work or Art of Limning performed  
with colours made up or mixed with oyl.

M 2

II. The

II. The materials of Painting are chiefly seven, 1. *The Easel*, 2. *The Pallet*, 3. *The Straining frame*, 4. *The Primed cloath*, 5. *Pensils*, 6. *The Stay*, 7. *Colours*.

III. *The Easel* is a frame made of wood (much like a ladder) with sides flat, and full of holes, to put in two pins to set your work upon higher or lower at pleasure; something broader at bottom than at the top; on the backside whereof is a stay, by which you may set the Easel more upright or sloping.

IV. *The Pallet* is a thin piece of wood, (Peartree or Walnut) a foot long, and about ten Inches broad, almost like an Egg, at the narrowest end of which is made an hole, to put in the thumb of the left hand, near to which is cut a notch, that so you may hold the pallet in your hand. *Its use is to hold and temper the Colours upon.*

V. *The Streining frame* is made of wood, to which with nails is fastened the primed cloath, which is to be painted upon.

These ought to be of several sizes according to the bigness of the cloath.

VI. The *Primed cloath* is that which is to be painted upon; and is thus prepared.

Take good Canvase and smooth it over with a slick-stone, size it over with size, and a little honey, and let it dry; then white it over once with whiting and size mixed with a little honey, so is the cloath prepared, on which you may draw the picture with a coal, and lastly lay on the Colours.

Where note, honey keeps it from cracking, peeling or breaking out.

VII. *Pensils* are of all bignesses, from a pin to the bigness of a finger, called by several names, as *Ducks quill fitch*ed and pointed; *goose quill fitch*ed and pointed; *Swans quill fitch*ed and pointed; *sewelling pensils*, and *bristle Pensils*: some in quills, some in tinn cases, and some in sticks.

VIII. The *Stay* or *Mol-stick*, is a Brazil stick (or the like) of a yard-long; having at the one end thereof, a little ball of Cotton, fixed hard in a

piece of leather, of the bigness of a chestnut; which when you are at work you must hold in your left hand; and laying the end which hath the leather ball upon the cloath or frame, you may rest your right arm upon it, whilst you are at work.

IX. The Colours are in number seven (*ut supra*) to wit White, Black, Red, Green, Yellow, Blew, and Brown.

*Of which some may be tempred on the pallet at first; some must be ground, and then tempred; and other some must be burnt, ground, and lastly tempred.*

X. To make the size for the primed cloath at the 5 è.

*Take glew, and boil it well in fair water till it be dissolved, and it is done.*

XI. To make the whiting for the 5 è.

*Take of the aforesaid size, mix it with whiting ground, and so white your boards or cloath (being made smooth) dry them, and white them a second or third time, lastly scrape them smooth and draw it over with white lead tempred with oyl.*

XII. To keep the Colours from skinning.

*Oyl*



Oyl colours ( if not presently used ) will have a skin grow over them, to prevent which, put them into a glass, and put the glass three or four inches under water, so will they neither skin nor dry.

XIII. To cleanse the Grinding stone and Pensils.

If the grinding stone be foul grind Curriers shavings upon it, and then crumbs of bread, so will the filth come off: if the pencils be foul, dip the end of them in oyl of Turpentine, and squeeze them between your fingers, and they will be very clean.

## CHAP. II.

### Of the Colours in General.

I. The chief *Whites* for painting in oyl are, White lead, Ceruse, and Spodium.

II. The chief *Blacks* are, Lamp black, Seacoal black, Ivory black, Charcoal, and earth of Colen.

III. The chief *Reds* are, Vermilion,

Smaper lake, Red lead, Indian Red, Ornotto.

IV. The chief *Greens* are, Verdigrise, Terra vert, Verditer.

V. The chief *Tellows* are, Pink, Masti-cote, English Oker, Spruse Oker, Orpiment.

VI. The chief *Blews* are, blew Bice, Indico, Ultramarine, Smalt.

VII. The chief *Browns* are, Spanish brown, Burnt Spruce, Umber.

VIII. These colours, Lamp black, Verditer, Vermilion, Bice, Smalt, Masticot, Orpiment, Ultramarine, are not to be ground at all, but only tempered with oyl upon the Pallet.

IX. These colours, Ivory, Céruse, Oker, and Umber are to be burnt, and then ground with oyl.

X. All the rest are to be ground upon the Grinding stone with Linseed oyl (except white lead, when it is to be used for Linnen, which then is to be ground with oyl of Walnuts, for Linseed oyl will make it turn yellow.)

## C H A P. III.

*Of the fitting of Colours for Painting.*

I. **U**Pon the Pallet dispose the several colours, at a convenient distance, that they may not intermix; first lay on the Vermilion, then the Lake, then the burnt Oker, then the India Red, Pink, Umber, Black, and Smalt, each in their order, and lay the white next to your thumb, because it is oft-  
nest used, for with it all shadows are to be lightned; and next the white a stiff sort of Lake; thus is the Pallet furnished with single colours for a face.

*Now to temper them for shadowing various complexions do thus.*

## II. For a fair complexion.

*Take White one Drachm; Vermilion, Lake of each two Drachmes, temper them, and lay them aside for the deepest Carnation of the face: to part of the aforesaid mixture put a little more white, for a light carnation: and*

and to part of that put more white (which temper on the Pallet) for the lightest colour of the face.

III. The faint shadows for the fair complexion.

Take Smalt, and a little White, for the eyes: to part of that adde a little pink, and temper by it self for faint greenish shadows in the face.

IV. The deep shadows for the same.

Take Sinaper Lake, Pink, and black of each, which temper together; if the shadows ought to be redder than what is tempered, add more Lake: if Yellower, adde more pink: if blewer or grayer, adde more black; thus shall the Pallet be fitted with colours.

V. For a brown or Swarthy Complexion.

The single colour being laid on the Pallet as before, and tempered; to the White, Lake, and Vermilion, put a little burnt Oker for a Tawney: and for heightning adde some Yellow Oker, so much as may just change the colours. The faint and deep shadows are the same at the 3 & 4 è.

VI. For

## VI. For a tawny Complexion.

The colours are the same with the former, but the shadows are different; which must be made of burnt Oker and Umber, (which will fit well:) if the shadow be not yellow enough, add a little pink to it.

## VII. For a black Complexion.

The dark shadows are the same with the former: but for heightning take White, Black, Lake and burnt Oker; in tempering of which put in the white by degrees, till you come to the lightest of all. Where note, that the single colours at first laid upon the Pallet and tempered, serve for shadows for all complexions; and that all deepnings ought to be with black, lake, and pink tempered together.

## CHAP. IV.

## Of Colours for Velvet.

**F**OR black Velvet. Take Lamp black and Verdigrise for the first ground; that being drie, take Ivory black,

black, and Verdigrise; shadow it with white Lead mixed with Lamp black.

II. *For Green.* Take Lamp black and white Lead, and work it like a russet Velvet, and let it drie; then draw it over with Verdigrise tempered with a little pink.

III. *For Sea green.* Take only Verdigrise and lay it over russet: If a *Grass-green*, put a little Masticot to it: shadow these greens with russet; which lay according to the deepness of the green.

IV. *For Red.* Take Vermilion, and shadow it with Spanish brown: and where you would have it darkest, shadow with Seacoal black and Spanish brown with the aforesaid colours; drie it, and then gloss it over with Lake.

V. *For Crimson or Carnation.* Take Vermilion, to which add white Lead at pleasure.

VI. *For Blew.* Take Smalt tempered alone.

VII. *For Yellow.* Take Masticot and yellow Oker; and where you would have it darkest, shadow it with Umber.

VIII. *For*

VIII. *For Tawney.* Take Spanish brown, white Lead, and Lamp black, with a little verdigriese, to shadow where need is; when drie, gloss it over with Lake and a little red Lead.

IX. *For hair colour.* Take Umber ground alone; and where it should be brightest, mix some white Lead: about the folds, lighten or darken with white Lead and Umber.

X. *For Ash colour.* Take Charcoal, black and white Lead: lighten with white Lead: a colour like to a dark *Ashe* will be an Ash colour.

XI. *For Purple.* Take Smalt and Lake, of each alike; temper them (light or deep as you please) with white Lead.

XII. *Lastly note*, that in painting Velvet you must at first work it somewhat sad, and then give it a sudden brightness.

## CHAP. V.

*Of colour for Sattins.*

I. **F**OR *Black*. Take Lamp black ground with oyl and tempered with white Lead; and where you would have it shine most, mix Lake with the white Lead.

II. *For Green*. Take Verdigrise ground alone and mixed with white Lead; adding Pink where you would have it brightest: to the deepest shadows add more Verdigrise.

III. *For Yellow*. Take Masticot, yellow Oker and Umber (ground each by themselves) where it should be brightest, use Masticot alone; where a light shadow, use Oker; where darkest, use Umber.

IV. *For Purple*. Take Smalt alone, and where it should be brightest, use white Lead.

V. *For Red*. Take Spanish brown (ground



(ground alone) mix it with Vermilion, and where it should be brightest, mix white Lead with the Vermilion.

VI. *Eor White.* Take white Lead (ground alone) and Ivory black, which temper light or dark.

VII. *For Blew.* Temper Smalt and white Lead; where it should be saddest, use Smalt; where lightest, white Lead.

VIII. *For Orange colour.* Take red Lead and Lake; where brightest, red Lead; where saddest, Lake.

IX. *For Hair colour.* Temper Umber and white Lead; where it should be brightest, put more white Lead; and where the greatest shadow, use Sea-coal black mixed with Umber.

CHAP.

Take Spanish brown  
(ground)

## CHAP. VI.

*Of Colours for Taffatie; Cloth and Leather.*

I. **T**affaties are painted much as Satins, thus: Take such colours as are fit for the purpose; and lay them one by another upon the work, and shadow them with others.

II. **Cloth** is the same work with Satin, save, you must not give to cloth so sudden a shining gloss.

III. **Cloth of Gold** is made of brown Oker and liquid Gold; water and heighten upon the same with small gold strokes.

IV. **For Buff**, mix yellow Oker and white Lead; and where it should be dark by degrees, mix it with a little Umber; when you have done, size it over with Umber and Seacoal black.

V. **For yellow Leather**, take Mastice and yellow Oker: shadow it with Umber.

VI. *For*

VI. *For black Leather*, take Lamp black, and shadow it with white Lead.

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C H A P. VII.

*Of Colours for Garments in general.*

I. *For Black*. Let the dead colour be Lamp black and Verdigrise: being dry, go over with Ivory black and Verdigrise; but before the second going over, heighten it with white.

II. *For Hair colour*. Take Umber and white for the ground; Umber and black for the deeper shadows; Umber and English Oker for the meaner shadows; white and English Oker for heightning.

III. *For Bleu*. Take Indico and White: first lay the White, then the Indico and White mixed; then deepen it with Indico; and when drie, glaze it with Ultramarine which will never fade.

*Smalt will turn black, and Bice will turn green.*

IV. *For Purple*. Take Smalt temper-  
N ed

ed with Lake and white Lead ; then heighten with white Lead.

V. *For a sad Red.* Take Indian Red heightned with White.

VI. *For a light Red.* Take Vermilion; glaze it over with Lake, and heighten it with White.

VII. *For a Scarlet.* Take Vermilion, and deepen it with Lake or Indian red.

VIII. *For Green.* Take Bice and Pink; heighten it vwith Masticot, and deepen vwith Indico and Pink.

IX. *For Yellow.* Take Masticot, yellow Oker, Umber; lay Masticot and White in the lightest places; Oker and White in the mean places; and Umber in the darkest; glaze it with Pink.

X. *For Orange colour.* Lay the lightest parts with red Lead and White, the mean parts with red Lead alone; the deeper parts with Lake; and if need is heighten it with white.

## CHAP. VIII.

*Colours for metals and precious stones.*

**I. FOR Iron.** Take Lamp black and white Lead ; if you would have it rusty, take seacoal black , and mix it with a little white.

**II. For Silver.** Take Charcoal black and white Lead : where you would have it darkest, use more Charcoal ; work silver somewhat rustish , and give it a sudden gloss with white Lead only.

**III. For Gold.** Take Lake, Umber, red Lead, Masticot : lay the ground with red Lead, and a little dry Pink : where you would have it darkest, shadow it most with Umber ; where lightest with Masticot.

*Note, in grinding the red Lead for the gold size, put in a little Verdigrise, to make it dry sooner.*

**IV. For Pearls.** Temper charcoal black with white Lead, till it be a per-

fect russet; then make the Pearl with it, and give it a speck of white lead only to make it shine.

*Where note, that Ceruse tempered with oyl of white Poppy, is excellent to heighten up Pearls.*

V. *For precious stones.* For Rubies, &c. lay their counterfeit grounds with transparent colours; and Lake, Verdigrise and Verditer give them a shining colour.

## CHAP. IX.

### *Of Colours for Landskip.*

I. **F**OR a light Green, use pink and masticot heightned with white: for a sad green, Indico and Pink heightned with masticot.

II. *For some Trees,* take Lake, Umber and white: for others charcoal and white: for others Umber, black, and white, with some green: adding sometimes Lake or Vermilion, with other colours.

III. *For*

III. *For wood*, take lake, umber and white, mixing sometimes a little green withall.

I V. *For Fire*, lay red Lead and Vermilion tempered together where it is reddest : where it is blew, lay oyl, smalt, and white lead : where it is yellow, take masticot, and work it over in certain places : where you would have it shine most, with Vermilion.

V. *For an Azure skie*, which seems far off, take oyl, smalt, or bice, and temper them with Linseed oyl.

VI. *For a red skie*, take Lake and White ; and for sun beams, or yellow clouds at sun-rising or setting, take masticot and white.

VII. *For a Night skie*, or clouds in a storm, take Indico deepned with black, and heightned with white.

VIII. *Lastly, for the practical performing of the work* have recourse to the rules delivered in chap. 13. lib. 1. and chap. 27. lib. 2.

## C H A P. X.

*Of the Painting of the face.*

I. **H**Ave your necessary pensils in readiness, as two pensils duck quill fitted; and two ducks quill pointed; two goose quill fitted; and two pointed: two bristles both alike: one Swans quill fitted, and one pointed: one larger pensil in a tin case fitted; and a bristle of the same bigness; every one having a stick of about nine inches long put into the quill thereof, the farther end of which stick must be cut to a point.

II. The pensils in a readiness in your left hand, with the pallet upon your thumb, prepared with fit colours; and your molstick to rest upon; you must work according to the directions following.

III. The cloth being pinned, and strained upon the frame, take a knife, and



and with the edge thereof scrape over the cloath, lest knots or the like should trouble it.

IV. Then set the *frame* and *cloth* upon the *Easel*, at a convenient heighth, that sitting on a stool (eaven with the party you draw) you may have the face of the picture equal, or something higher than your own: set the *Easel* to the light (as in Limning we have taught) letting it come in upon your left hand, casting the light towards the right.

V. Let the person to be drawn, sit before you in the posture he intends to be painted in, about two yards distant from you.

VI. Then with a piece of painted chalk draw the proportion of the face upon the cloth, with the place of the eyes, nose, mouth, ears, hair, and other postures.

*Here is no difficulty in this, if you miss much, the colours will bring all to rights again.*

VII. Then take a pencil Swans quill  
N 4 pointed,

pointed, and begin to paint some of the lightest parts of the face, with the lightest colour, ( as the heightning of the forehead, nose, cheek-bone, of the lightest side :) the mean parts next ( as the cheek-bone of the dark side, chin, and over the upper lip :) proceeding gradually till you come to the reddest parts of all.

VIII. Lay faint greenish shadows in convenient places ; and where it is necessary to soften harsher shadows ; but take heed of putting green where red should be.

IX. The faint or light parts thus done, take one of the Goose quill pointed, or Ducks quill fitched, and begin at the eyes to shadow with Lake, going over the nose, mouth, compass of the ear &c. before you lay on any colour, wiping it lightly over with a linnen rag, to prevent the overcoming of the other colours.

X. The colours both light and dark being put in, take a great fitch pencil, and sweeten the colours therewith ;  
by

by going over the shadows with a clean soft pencil, which being well handled will drive and intermix the colours one into another, that they will look as if they were all laid on at once, and not at divers times.

Where note that the bigger pencils you use, the sweeter and better your work will be.

XI. At the second sitting, begin again with clean pencils, of such bigness as the work requires, and observe well the person, and see what defects you find in your work at first sitting, and amend them; then heighten or deepen the shadows as occasion requires.

XII. Lastly, take a Goose quill bristle, and put in the hair about the face (if there must be any) and rub in the greater hair, with the greater Bristle; heightning it up with the Goose quill pencil.

## CHAP. XL

*Of the cleansing of any old painting.*

I. **T**Ake good Wood ashes, and searce them; or else some Smalt or powder blew, and with a sponge and fair water gently wash the picture you would cleanse (taking great care of the shadows) which done, drie it very well with a clean cloth.

II. Then varnish it over again with some good varnish, but such as may be washed off again with water if need be.

*We shall hereafter shew the way of making varnish of several sorts; mean season this following may serve.*

III. Take either Common varnish (made with Gum-sandrack dissolved in Linseed oyl by boiling) or Glair of Eggs, and with your pencil go over the picture, once, twice, or more therewith as need requires.

CHAP.

## CHAP. XII.

*The painting of the Antients exemplified,  
first in some of their Heathen gods.*

**JUPITER**, (their chief god) paint with long black curled hair, in a purple robe, trimmed with gold, and sitting on a golden throne, with bright yellow clouds dispersed about him.

**II. APOLLO** or *Sol* (the god of Physick) with long, curled, yellow hair, crowned with a laurel, in a purple robe, a silver bow, golden hair, and throne of Emeralds.

**III. MERCURY**, with long, yellow, curled hair, in a coat of flame colour, with a mantle purely white, trimmed with gold and silver; his beaver white with white feathers, his shoes golden, his rod silver.

**IV. NEPTUNE**, with long, hoary hair, in a blew or sea green mantle, trimmed

trimmed with silver, riding in a bleVV chariot, or on a Dolphin, of a browvn black colour, vvith a silver trident in his right hand.

V. PLUTO, vvith long, curled, black hair, in a robe of cloth of gold.

VI. BACCHUS, vvith short, browvn, curled hair, vvith a Leopards skin spotted; or in a green mantle; a raveny face, vvith a vvreath of Vine branches.

VII. HYMEN vvith long yellow hair, in a purple or saffron coloured mantle.

VIII. VULCAN paint in a scarlet robe.

IX. TRITON (*Neptune's Trumpe-ter*) vvith a bleVV skin, and in a purple mantle.

X. CUPID vvvas painted by *Zeuxis* (*that famous painter of Greece*) in a green robe.

XI. MINOS (*one of the Judges of hell*) vvith hair long, browvn, and curled; crownd vvith a golden crowvn; his robe bleVV and silver, his buskins of gold.

XII. MO-

**XII. MOMUS** (*the carping god*)  
vvith a darkish robe; his beard and hair  
party-coloured.

CHAP. XIII.

*Of the painting of some of the Heathen  
goddeses.*

**I. JUNO** (*Queen of the goddeses*)  
vvith black hair and eyes, adorn-  
ed vvith a sky-coloured mantle, or pied;  
vvrought vvith gold and peacocks  
eyes; like the orient circles in the pea-  
cocks train.

**II. DIANA** (*the goddes of chasti-  
ty*) vvith yellowv hair; a gras green  
mantle, trimmed vvith silver; buskins  
silver; bovv golden; quiver painted co-  
lours.

**III. PALLAS** (*the goddes of wis-  
dom*) vvith a blevv mantle imbroidred  
vvith silver.

**IV. VENUS** (*the goddes of love  
and beauty*) vvith gold yellowv hair, at-  
tired

tired vvith black ; a scarlet (or else dun coloured) robe.

V. CERES (*the goddess of corn and plenty*) vvith yellow hair, and a stravy-coloured mantle trimmed vvith silver.

VI. TELLUS (*the goddess of the earth*) in a green mantle.

VII. URANIA in a mantle of azure, filled vvith lamps.

VIII. AURORA in a purple robe, in a blew mantle fringed vvith silver.

IX. PROSERPINE (*Queen of hell*) in a black mantle trimmed vvith gold flames.

X. VESTA (*the daughter of Saturn*) in vvwhite garments filled vvith flames.

XI. ASTREA (*the goddess of justice*) in a crimson mantle, trimmed vvith silver.

XII. FLORA (*the goddess of flowers*) in a mantle of divers colours.

XIII. NIGHT, in a black mantle spotted vvith stars of gold.

XIV. Lastly, the three GRACES in silver robes.



## CHAP. XIV.

*The Painting of Law-givers, Emperours  
and Kings, and Queens.*

**M**OSES (the Hebrew Lawgiver) with bright hair; a very beautiful visage, with radiant scintillations about his head, in form of hoariness, which in painting is called Glory.

**II. NUMA POMPILIUS**, with white hair, crowned with a silver bend or diadem; his robe Crimson trimmed with Gold; his mantle yellow trimmed with Silver; his buskins watchet and silver.

**III. ÆNEAS** (the Trojan prince) in a purple mantle trimmed with Gold.

**IV. DAVID** (the King of Israel) with brown hair and a ruddy complexion.

**V. ALEXANDER MAGNUS**, with brown hair and a ruddy complexion.

**VI. RO-**

VI. ROMAN EMPEROURS, with yellow Carussers embroidered with silver; the labels of their sleeves, and short bases of watchet; the under sleeves and long stockings, white; a Lawrel wreath, with a silver jewel before, and rays of gold issuing from the wreath.

VII. GERMAN EMPERORS, with a Violet coloured robe, watchet or light coloured.

VIII. MAHOMET (the Turks great Prophet) in garments all of green.

IX. GUSTAVUS ADOLPHUS (King of Sweden) with yellow hair.

X. DIDO (Queen of Carthage) in a Purple or Scarlet mantle; under her garments Purple; a Golden quiver; her hair yellow, tyed up with Spangs and Knots of Gold.

XI. ELIZABETH (Queen of England) pale faced, light brown hair, and gray-eyed.

## CHAP. XV.

*The Painting of Philosophers, and  
the Sybills.*

**P**ITHAGORAS in white garments, with a crown of Gold.

**II. EMPEDOCLES** in Violet, Murry, or Purple, and so the rest of the *Grecian Philosophers*.

**III. ERASMUS ROTERDAMUS**, yellow haired, gray-eyed, and somewhat pale.

**IV. BEZA** is painted with white hair.

**V. SIBILLA AGRIPPA**, a woman in years in a roseal garment.

**VI. SIBILLA LIBICA** an elderly woman, crowned with a garland of flowers, in purple garments.

**VII. SIBILLA DELPHICA**, with a black garment, a young woman with a horn in her hand.

**VIII. SIBILLA PHRIGIA**, in  
O red

red garments, having an old Saturnian, hard favoured face.

**IX. SIBILLA HEROPHIL**, a young woman very fair in a purple garment, and head covered with a vail of Lawn.

**X. SIBILLA EUROPEA**, a comely young woman, having a high, red coloured face, a fine vail on her head, and clad in a garment of Gold work.

**XI. SIBILLA PERSICA**, with a white vail, and a golden garment.

## CHAP. XVI.

### *The Painting of Arts, Vertues, and Passions.*

**I. A** *Rithmetick* is painted in cloath of Gold: *Geometry*, fallow faced, green mantle fringed with silver, and a silver wand in her right hand: *Astronomy* with a silver Cressant on her forehead, an Azure mantle, a watchet Scarf, with

with golden Stars:

II. *Faith* is painted in white garments, vvith a cup of Gold: *Hope* in blevv, vvith a silver Anchor: *Charity* in yellowv robes; on her head a tyre of Gold vvith precious stones; her chair Ivory:

III. *Religion* in a silver vail, vvith a mantle or garment of vvwhite: *Justice* in a vvwhite robe, and a vvwhite mantle; vvith a coronet of silver and vvwhite buskins: *Innocency* in White vvholly.

IV. *Concord* in a sky coloured robe, and a yellowv mantle; *Peace* in vvwhite, fringed vvith stars, or a carnation mantle fringed vvith gold, a vail of silver, green buskins, and a palm in her hand in black: *Unanimity* in a blevv robe, mantle and buskins, vvith a chaplet of blevv lillys.

V. *Wisdom* in a white robe, blew mantle, fringed vvith stars; *Law* in purple robes, fringed vvith gold stars, a mantle of Carnation fringed vvith gold; purple and yellow buskins: *Government* in Armour.

VI. *Watchfulness* in a yellowv robe;

a Sable mantle fringed with silver, and seeded with waking eyes; a chaplet of turnsole; in her right hand a lamp; in her left a bell: *Confidence* in a party coloured garment: *Modesty* in blew.

VII. *Eternity* in blew, seeded with Golden stars: *The Soul* in white garments, branched with gold and pearl, and crowned with a garland of Roses: *Felicity* in purple trimmed with silver.

VIII. *Love*, in Crimson fringed with gold, a flame coloured mantle, a chaplet of red and white Roses: *Natural affection* in Citron colour: *Envy* in a discoloured green garment, full of eyes.

IX. *Joy* in a green robe, and a mantle of divers Colours, embroidered with flowers; a garland of Myrtle; in her right hand a Crystal Cruise; in her left, a golden cup: *Pleasure* in light garments, trimmed with silver and gold: *Laughter* in several Colours.

X. *Wit*, in a discoloured mantle: *Jollity*, in flame colour: *Pastime*, in purple trimmed with Gold.

XI. *Opinion*, in black Velvet, black cap,

cap, with a white fall: *Impudence* in a party coloured garment: *Audacity* in blush colour.

XII. *Honour*, in a purple robe wrought with gold: *Liberty* in white: *Safety*, in Carnation.

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C H A P. XVII.

*Of Colours for Painting Glas.*

**YELLOW.** Take a very thin piece of pure fine silver, and dip it into melted brimstone; take it out with a pair of plyers, and light it in the fire, holding it, till it leaves burning; then beat it to powder in a brasen mortar; and then grind it with gum Arabick water, and a little yellow Oker.

II. **YELLOW.** Take fine silver one Drachm, Antimony in powder two Drachmes, put them in a hot fire, in a crucible for half an hour, and then cast it into a brass mortar, and beat it into powder, to which adde yellow Oker

six Drachmes, old earth of rusty Iron seven Drachmes, grind all well together.

*This is fairer than the former.*

III. WHITE. This is the colour of the glass it self: you may diaper upon it with other glass or Crystal ground to powder.

IV. BLACK. Take Jet and Scales of Iron, and with a wet feather take up the Scales that fly from the Iron, after the Smith hath taken his heat, grind them with gum water.

V. BLACK. Take Iron scales, Copper scales of each one Drachm, heat them red hot in a clean fire shovel; then take Jet half a Drachm, first grind them small, and temper them with gum water.

VI. RED. Take *Sanguis Draconis* in powder, put to it rectified spirit of wine; cover it close a little while, and it will grow tender; wring it out into a pot, that the dross may remain in the cloath; the clear preserve for use. This is a fair red.

VII. CARNATION. Take tin  
glass



glass one ounce: jet three ounces: red  
oker five ounces: gum two drachmes,  
grind them together. It is a fair Carna-  
tion.

VIII. CARNATION. Take jet  
four Drachmes: tin glass or litharge of  
silver two Drachms: gum, and scales of  
iron of each one Drachm, red chalk one  
ounce, grind them.

IX. GREEN. Take Verdigrise and  
grind it well with Turpentine, and put it  
into a pot; warming it at the fire, when  
you use it.

X. BLEW. Provide the clearest  
leads you can get of that colour, beat  
them to powder in a brazen mortar;  
take Goldsmiths Amel of the same co-  
lour, clear and transparent, grind each  
by it self, take two parts of lead, and one  
of Amel, grind them together as you did  
the silver. *The same understand of Red  
and Green.*

## C H A P. XVIII.

*Of the way of Painting upon Glass.*

I. **T**HERE are two manner of ways of painting upon glass; the one is for oyl colour, the other for such colours, as are afterwards to be annealed or burnt on.

II. To lay oyl colours upon glass, you must first grind them with gum water once, and afterwards temper it with Spanish Turpentine, lay it on, and let it dry by the fire, and it is finished.

III. To anneal or burn your glass, to make the colours abide, you must make a four square brick furnace, eighteen inches broad and deep; lay five or six cross Iron bars on the top of it, and raise the furnace eighteen inches above the bars: then laying a plate of Iron over the bars, sift ( through a sieve ) a lay of slack'd lime over the plate, upon which lay

lay a row of glass; upon that a bed of lime, and upon that lime, another row of glass; thus continue *stratum, super stratum* till the furnace is full.

IV. Lay also with every bed of glass a piece of glass, which you may wipe over with any Colour (these are called watches;) and when you think your glass is burnt enough, with a pair of plyers take out the first and lowest watch, lay it on a board, and being cold, try if you can scrape off the Colour, if it hold fast on, take out that row; always letting it abide the fire till the colour will not scrape off.

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## C H A P. XIX.

*Of Washing, and the Materials thereof.*

BY washing, here we intend nothing else, but either to set out Maps or Printed Pictures in proper Colours, or else to vernish them.

I I. The

II. The Instruments and Materials of washing are chiefly six, to wit, 1. *Alom* water, 2. *Size*, 3. *Liquid Gold*, 4. *Pensils*, 5. *Colours*, 6. *Vernish*.

III. *To make Alom water.* Take *Alom* eight ounces, fair water a quart, boyl them till the *Alom* is dissolved.

IV. *To make size.* Take *glew*, which steep all night in water, then melt it over the fire, to see that it be neither too strong nor too weak: then let a little of it cool; if it be too stiff when it is cold, put more water to it, if too weak more *glew*, using it lukewarm.

V. *Liquid Gold.* It is exactly made by the 1<sup>e</sup> & 21. lib. 2.

VI. *Pensils* are to be of all sorts both fitch'd and pointed; as also a large *penfil* brush to past Maps upon Cloath; another to wet the paper with *Alom* water; a third to starch the face of the picture withall before it be coloured; and fourth to varnish withall.

VII. The colours are the same with those which we mentioned in Chap. 17. lib. 2. to which add, 1. *Of Black*, *Printer*

ers black, Franckford black, 2. *Of Red*, Vermilion, Rosset, 3. *Of Blew*, Verditure, Litmos, Flory, 4. *Of yellow*, Cambogia, Yellow berries, Orpiment, 5. *Brazil*, Logwood (ground) and Turnsole, Cochinele, Madder.

## C H A P. XX.

### *Of Colours simple for Washing.*

**I.** *Printers black*, Vermilion, Rosset, Verditure, and Orpiment are to be ground, as we have taught at the 5. & 22. lib. 2.

**II.** *Brazil*. To some ground Brazil put small Beer and Vinegar, of each a sufficient quantity, let it boil gently a good while, then put therein Alom in powder to heighten the Colour, and some gum Arabick to bind it; boil it till it taste stronge on the tongue, and make a good red.

**III.** *Logwood*. Ground Logwood boiled as Brazil, makes a very fair tran-

transparent Purple Colour.

IV. *Cochenele*. Steeped as Brazil was boiled, makes a fair transparent purple: as thus, take *Cochenele* and put it into the strongest Sope lees to steep, and it will be a fair purple, which you may lighten or deepen at pleasure.

V. *Madder*. Take *Madder* four Drachms, ground Brazil one ounce, Rainwater a quart; boil away a third part: then add *Alom* half an ounce, boil it to a pint; then gum Arabick one ounce, which boil till it is dissolved, cool it stirring it often, and strain it for use. It is a good scarlet die for Leather.

VI. *Verdigriese*. Take *Verdigriese* ground finely one ounce, put to it a good quantity of common vernish, and so much oyl of Turpentine, as will make it thin enough to work withal, it is a good green. And *Verdigriese*, *Alom*, of each one Drachm, Logwood three Drachms, boiled in Vinegar makes a good Murry.

VII. *Gambogia*. Dissolve it in fair spring water, and it will make a beautiful

ful and transparent yellow : if you would have it stronger, dissolve some Alom therein : it is good for Silk, Linnen, white Leather, Parchment, Vellom, Paper, quills, &c.

VIII. *Yellow Fustick berry.* Boil it in water or steep them in Alom water, it makes a good yellow for the same purpose.

IX. *Turnsole.* Put it into sharp Vinegar over a gentle fire, till the Vinegar boil, and is coloured; then take out the Turnsole and squeeze it into the Vinegar, in which dissolve a little gum Arabick; it shadows very well on a Carnation or yellow.

X. *Litmos.* Cut it into small pieces, and steep it a day or two in weak gum Lake water, and you will have a pure blew water to wash with.

XI. *Flory Blew.* Grind it with Glair of Eggs, if then you add a little Roset it makes a Light Violet Blew; mixed with White and Red Lead, it makes a Crane leather Colour.

XII. *Saffron.* Steeped in Vinegar and

and mixed with gum water is a good Yellow.

## CHAP. XXI.

### *Of Compoundd Colours for Washing.*

I. **Orange Colour.** Red Lead and Yellow berries make a good Orange Colour: or thus, take Arnotto half an ounce, Pot ashes one Drachm, water one pound, boil it half away, then strain it, and use it hot.

*It is good for white leather, paper, vellom, quills, parchment, &c.*

II. **Green.** Take destilled vinegar, filings of Copper, digest till the vinegar is blew, which let stand in the Sun or a slow fire till it is thick enough and it will be a good green.

Or thus, Take Ceader green (which is best of all) or in stead thereof green Bice, steep it in Vinegar, and strain it; then grind it well with fair water, and put to it a little honey, and dry it well;

*when*



When you use it mix it with gum water.

III. *A light green.* Take Juyce of Rew, Verdigrise, and Saffron, grind them well together and use them with gum water.

Or thus; Take sap green, flower de lice, or tawny green, which steep in water: Verditure and Ceruse mixt with a little copper green, makes a good light colour.

IV. *Blew.* Ultramine; blew bice, salt, and verditure, ground singly with gum water, or together, make a good blew.

V. *Brown.* Ceruse, red lead, English Oker, and pink, make a good brown.

VI. *Spanish brown.* To colour any horse, dog, or the like, you must not calcine it; (yet not calcined it is a dirty colour) but to shadow Vermilion, or lay upon any dark ground, behind a picture, to shade berries in the darkest places, or to colour wooden posts, wain-scot, bodies of trees, and the like, it is very good (being burnt.)

VII. *Flesh colour.* Mix white, Indian lake,

lake, and red lead (according as you would have it light or deep;) and to distinguish a mans flesh from a womans, mingle with it a little Oker.

VIII. *Colours of Stones.* Verdigrise with Vernish makes an Emerald: with Florence lake a Ruby: with Ultramarine a Saphyr.

## CHAP. XXII.

### *Of Mixing Colours and shadowing.*

**I**N mixing be careful not to make the colour too sad, nor take the pencil out of one colour and put them into another.

II. In mixing colours, stir them well about the water severally till they are well mixed; then put them together, making the colour sadder or lighter at pleasure.

III. *Green* is shadowed with Indigo and yellow berries.

IV. *Blue* is shadowed with Indigo.

littiose and flory; or any of them being steeped in lees of Soap ashes, and used with gum water.

V. *Garments* are shadowed with their own proper colours; or you may mingle the colour with white (for the light) and shadow it with the same colour unmingled: or you may take the thinnest of the colour for the light, and shadow with the thickest or bottom of the same.

VI. *Sap green* is only used to shadow other greens with, and not to be laid for a ground in any garment.

VII. *Lake* ought not to be shaded with any colour, for it is a dark red; but for variety you may shadow it with *Bice* or *blew Verditure*, which will make it changeable *Taffata*.

VIII. The shadow for *Yellow berries* *Umber*; but for beauties sake with *Lead*, and the darkest touches with *Spanish brown*; and for variety with *Copper green*, *blew Bice* or *Verdure*.

IX. *White* sets off *blems* and *blacks*

very well; Red sets off well with yellow. Yellow with reds, sad blews, browns, greens, and purples.

X. Blew sets off well with yellows, reds, whites, browns, and blacks; and Green set off well with purples, and reds.

## CHAP. XXIII.

### *Of Colours for Landships.*

I. **G**reen mixed with white, pink, bice, masticot, smalt, indico, or ceruse, or blew verditure mixt with a few yellow berries makes a good green for Landships.

II. For the *fadedest* hills use umber burnt; for the *lightest* places, put yellow to the burnt umber: for other hills lay copper green thickned on the fire, or in the sun: for the next hills further off mix yellow berries with copper green: let the fourth part be done with green verditure; and the *farthest* and *faintest* places with blew bice; or blew verditure mingled.

mingled with white, and shadowed with blew verditure, in the shadows indifferent thick.

III. Let the *high-ways* be done with red and white lead, and for variety yellow oker; shadow it with burnt umber, which you may use for sandy rocks and hills.

IV. *Rocks* may be done with several colours, in some places black and white, in other places with red and white, and in others with blew and white, and the like, as you see convenient.

V. *The water* must be black verditer and white, shadowed with green and blew verditure: when the *banks* cast a green shadow upon the water, and the water is dark shadowed, then shade it with indico, green thickned and blew verditure.

VI. Colour *buildings* with as much variety of pleasant colours as may be imaginable, yet let reason be your rule in mixing your colours: you may sometimes use white and black for the *wall*, *conducts* or other things: for *Brick-houses*

and the like, red lead and white: if *many houses* stand together, set them off with variety of colours, as umber and white; lake and white; red lead and white, and the like.

VII. Lastly, for the *skie*, use masticot or yellow berries, and white for the *lowest and lightest places*; red roset and white, for the *next degree*; blevv bice and vvhite for the *other*; blevv bice, or blevv verditure for the *highest*.

*These degrees and colours, must be so wrought together, that the edge of each colour, may not receive any sharpness; that is, so as that you cannot perceive where you began to lay them, being so drowned one in another.*

## CHAP. XXIV.

*Of the practice of Washing.*

1. **W**ith the *Alom-water* vyet over the pictures to be coloured, for that keeps the colours from sinking into

into the paper, and vwill add a lustre unto them, make them shevv fairer, and keep them from fading.

I I. Then let the paper dry of it self (being washed with *Alom-water*) before you lay on the colours; or before you wet it again, for some paper will need wetting four or five times.

III. The washing of the paper with the *Alom-water* must be done with a large pencil brush, such as we have adviſed to at the 6<sup>e</sup> 19. of this Book.

IV. But if you intend to *varnish* your pictures after you have coloured them; instead of washing them with *Alom* water, first size them with new size, made of good white starch, with a very fine brush; and this you must be sure to do all over, for else the varnish will sink through.

V. Having thus prepared your work, go to laying on your Colours according to the former directions, suiting them, as near as may be, to the life of every thing.

VI. The picture being painted, you  
P 3 may

may with fize (at the 4 & 19. of this book) paste your maps or pictures upon cloth, thus : wet the sheet of cloth therein, wring it out, and strain it upon a frame, or nail it upon a wall or board, and so paste your maps or pictures thereon.

VII. *Lastly*, if the picture be to be *varnished*, having thus fixed it into its proper frame, then varnish it with a proper *varnish* (by the following rules) and the work will be fully finished.

## CHAP. XXV.

### *Of the making of Varnishes.*

I. **V**ARNISH *for Painting in Oyl.*  
Take Mastich two ounces, Oyl of Turpentine one ounce ; put the Mastich in powder into the Oyl, and melt it over the fire, letting it boil little or nothing (lest it be clammy ; ) when it is enough, you may know by putting in a hens feather, for then it will burn it.

II. *Var-*



*I. I. Varnish for painted pictures.*

Take white Rozin one pound, Plumb-  
ree gum (or gum Arabick) Venice Tur-  
pentine, Linseed oyl, of each two ounce-  
s; first melt the Rozin and strain it  
very hot; steep the gum in oyl Olive  
(oyl ben is better) till it is dissolved,  
and strain it, to which put the Turpen-  
tine and Rozin, and over a slow fire  
mingle them till they are well dissolv-  
ed. When you use it, use it hot.

*I. II. Another for the same.*

Take Olibanum, and gum Sandrack in  
powder, which mingle with Venice Tur-  
pentine, melting and incorporating them  
still over a gentle fire; then strain it hot.

*When you use it, let it be hot, and your  
Varnish will shine well, it dries immediately.*

*I. V. Another for the same.*

Take Oyl of Linseed which destil in  
a glass Retort one ounce, fair Amber  
dissolved three ounces, mix them over a  
slow fire, and it is done.

*V. A very good Varnish for Gold, Silver,  
Brass, Iron, Stone, Wood, Vellum or Paper.*

Take Benjamin (made into fine powder

between two papers) put it into a vial, and cover it with spirit of Wine four fingers above it, and let it stand three or four days, then strain it, and it will be bright and shining, drying immediately, and retaining its brightness many years.

If you varnish Gold, or any thing gilded, before the straining you should put in a few blades of Saffron for colour sake: but if Silver or any thing white, you ought to use the white part of the Benjamin only.

VI. A Varnish particularly for Gold, Silver, Tin, or Copper.

Take Linseed oyl six ounces; Mastich, Aloes Epatick of each one ounce; put the gums in powder into the Oyl, into a glazed earthen pot, which cover with another, luting them together, in the bottom of which, let be a hole, whereinto put a small stick with a broad end to stir withal; cover them all over with clay, (except the hole) set it over the fire, and stir it as often as it seetheth for a little while, then strain it for use. First

let

let the metal be polished, then strike it over with this Varnish.

VII. *A Varnish for Wood and Leather.*

Take Tincture of Saffron or Turmeric in spirit of Wine a pint, prepared gum Lake a sufficient quantity, dissolve the gum in the tincture and it is done.

*This is a Varnish of great use to lay over Gold and Silver or any thing which is exposed to the Air.*

VIII. *To make the Common Varnish.*

Take spirit of Wine a quart, Rozin one ounce, Gum Lake a sufficient quantity, dissolve the gums in a gentle heat (being close covered) and let them settle: then gently decant off the clear, which keep in a close glass Bottle for use.

*The thick which remains, you may strain through a cloth, and keep for other purposes.*

IX. *To make a red Varnish.*

Take spirit of Wine a quart, gum Lake four ounces, Sanguis Draconis in fine powder eight ounces, Cochenele one ounce,

ounce, digest a week over a gentle heat, then strain it for use.

X. *To make a Yellow Varnish.*

Take spirit of Wine a pint, in which infuse (three or four days) Saffron half an ounce, then strain it, and add Aloes Succotrina one ounce, Sanguis Draconis two ounces, which digest a week over a gentle heat close covered, then strain it for use.

XI. *An Universal Varnish, the best of all others.*

Take good gum Sandrick (but gum Anime is better) dissolve it in the highest rectified spirit of Wine (an ounce and a half more or less to a pint) and it is done.

Where note: 1. That unless the spirits be highly rectified, the Varnish cannot be good. 2. That some put into it Linseed oil (which is naught) oil of ben is better) and mix them together. 3. Some mix boiled Turpentine with it; others Chymical ayts of deep colours (as of Cloves, Mace, Nutmegs, Caraways, Cinnamon) according to the intent. 4. That it is bought

be kept in a glass bottle close stopped;  
lest it curdle, and the gums separate.

## CHAP. XXVI.

### *Of the manner of Varnishing.*

**T**He intent of Varnishing is either  
to preserve the gloss of paintings  
or pictures, or else to represent and imi-  
tate the forms of shining and perlucid  
bodies.

**I.** To varnish paintings and pictures  
tis no more but with a pencil dipt in  
the Varnish to go over the same, then  
letting it dry; and so going over it so  
often as in reason you shall see conve-  
nient.

**II.** If you are to imitate any thing,  
as Marble, Tortoise shell, Amber, *Lapis  
Lazuli* or the like; you must first make  
the imitation of them, upon that which  
you would Varnish, with their proper  
colours, as in Limning or Painting with  
oil; which must be thoroughly dry;  
then

then by the 2<sup>d</sup>. go over all with the Varnish, so often till you see it thick enough; letting it dry every time leisurely. *For example sake;*

#### IV. To imitate MARBLE.

Take of the Universal *Varnish* at the 11<sup>e</sup> 25. with which mingle Lamp black (or other black) and white Lead finely beaten, and with a brush pencil, marble the thing you would *Varnish* according to your fancy; lastly, being dry strike it again two or three times over with the clear *varnish* alone, and it will be perfect.

#### V. To imitate TORTOISE shell.

First lay a white ground, then with convenient colours (as Vermilion with Auripigment) duly mixt with Common Varnish, streak and shadow the white ground with any wild fancy (as nearly imitating Tortoise shell as you can) which being dry, strike it here and there with the red *Varnish* (mixed with a little Sinaper or Indian Lake) then up and down the work as nature requires touch it with Varnish mixed with any  
good

ood black; then stroke it over with Universal Varnish four or five times, letting it dry every time; lastly, let it dry well a week, and with Pumice stone (in fine powder) and a wet cloth polish it by rubbing; then go over it again three or four times with the Universal Varnish, and (if need require) polish it again with fine putty as before; after which you may once again strike it over with the said Varnish, and it will be done.

V. I. To imitate TORTOISE shell upon silver or gold.

A white ground being laid, and smeared over with Vermilion or the like; lay over the same leaves of silver or gold (as we have taught in other places) either with gum Ammoniacum, Lake, common varnish or glair; this done, and being dried, shadow it according to reason; striking it over here and there with yellow varnish, and with the yellow varnish mixed with a little red varnish; all things being done (in imitation of the shell) strike it several times over with the Universal Varnish, and polish

lish it (in all respects) as before.

- V H. To imitate Lapis LAZULI.

Upon a ground of white Lead, Spodium or the like in common Varnish (being first dry) lay Ultramarine or some other pure blew well mixed with the Universal Varnish, so as that the ground may not appear: then with wild, irregular streaks (in resemblance of Nature) with liquid or shell gold, run stragglingly all over the blew, adding very small specks upon the blew part, of such various colours, as are usually to be seen upon the stone.

~~A white ground being laid over with Vermilion or the like & gold over the same leaves of silver or gold~~

- CH A P. XXVII.

Experimental Observations of Vegetable

Colours In General.

Thinking it over here and there

1. A Strong infusion of galls filtered

- mixed with a strong and clear

solution of Vitriol, makes a mixture

black as Ink: which with a little strong

oil of Vitriol is made transparent again

after



after which the black colour is regained again, by the affusion of a little quantity of a strong solution of salt of tartar.

The first black (although pale in wetness, yet) being dry, appears to be good.

II. Decoction of dried red roses, in fair water, mixed with a little of the diluted solution of blew vitriol made a black colour: this mixed with a little aqua fortis, turn'd it from a black, to a deep red; which by affusion of a little Spirit of Urine, may be reduced straight to a thick and black colour.

III. Yellow wax is whitened by dissolving it over the fire in spirit of wine, letting it boil a little, and then exhaling the spirit of wine; or else whilst it melts, separating it by filtration.

IV. Fair water mixed with a blood red rincture of Benjamin, drawn with spirit of wine, immediately makes it of a milk white colour.

V. Blackness may be taken away with oyl of Vitriol; so black pieces of silk

silke or hair I have turn'd to a kind of yellow.

VI. A handful of *Lignum nephriticum* rasped, infused in four pound of spring water, yields between the light and the eye an almost golden colour (unless the Infusion be too strong) but with the eye between the light and it (in a cleare vial) a lovely blew as indeed it is: this with spirit of Vinegar may be made to vanish (still keeping its golden colour) and after with oyl of Tartar *per deliquium* may be restored again.

VII. Cloathes died with blew and Wood, as by the yellow decoction of *Luteola* died into a green.

VIII. Syrup of Violets mixed with a high solution of Gold in *Aqua regia*, produces a redish mixture; and with a high solution of filings of Copper in spirit of Urine, a lovely fair green.

IX. Syrup of Violets mixed with a little juyce of Lemons, spirit of salt vinegar, or the like acid salt, will be immediatly red: but mixt with oyl of

Tar.

Tartar, or a solution of pot ashes, it will in a moment be perfect green: the like a juyce of blew bottels.

X. A good quantity of oyl of Tartar, put into a strong solution of Verdigrise, gives a delightful blew; which may be variously changed by adding spirit of Urine, or hartshorn.

XI. Although red roses hung over the fume of Sulphur, lose all their redness, and become white: yet oyl of Sulphur (which is nothing but the fumes condensed) doth wonderfully heighten the tincture of the same.

XII. *Cochinele* will have its colour far more heightned by Spirit of Urine, than by rectified spirit of wine: And one grain of *Cochinele* in a good quantity of spirit of Urine, being put into one hundred twenty six ounces of water, tinged it (although but faintly:) which amounts to above one hundred twenty five thousand times its own weight.

XIII. The juyce of privet berries with spirit of salt, is turned into a lovely red:

red: but with a strong solution of pot ashes into a delightful green.

XIV. Upon things red by nature as syrup of Clovegilliflowers, juyce of buckthorn berries, infusion of red roses, Brazil, &c. Spirit of Salt makes no considerable change, but rather a lighter red: but other salts turn them into a greenish; especially juyce of buckthorn berries.

XV. Juyce of *Jasmin* and snow drops, by a strong *alkalizate* solution, was (although of no colour) turned into a deep greenish yellow.

XVI. *Buckthorn* berries being gathered green and dried, are called *sap-berries*, which being infused in *Alom* water gives a fair yellow (which is used by *Book-binders* for the edges of their books, and to colour leather also;) being gathered when they are black, they are called *sap green*, and make a green colour being put into a brass or copper vessel for three or four days; or a little heated upon the fire, and mixed with *Alom* in powder, and pressed forth; so put into  
 D  
 blad-

bladders hanging it up till it is dry: And being gathered about the end of November, (when they are ready to drop) they yield a purplish colour.

XVII. Tincture of *Cochenele*, diluted never so much with fair water, will never yield a yellow colour: a single drop of a deep solution in spirit of Urine, diluted in an ounce of fair water, makes a fair pink, or carnation.

XVIII. Oyl or spirit of Turpentine, digested with pure white sugar of lead, yields in a short time a high red tincture, which chymists call *Balsamum Saturni*.

XIX. Spirit of Salt dropt into a strong infusion of *Cochenele*, or juyce of black cherries, makes immediatly a fair red: but dropt into the Infusion of Brazil, a kind of yellow: so the filtrated tincture of *Balaustins* mixed with good spirit of Urine, or the like, turns of a darkish green; but with spirit of salt, a high redness, like rich Claret wine; which glorious colour may in a moment be destroyed, and turned into a dirty green, by spirit of Urine.

XX. A high Infusion of *Lignum Nephriticum*, mixed with spirit of Urine, gives so deep a blew, as to make the liquor *opacons*: which after a day or two vanishes, and leaves the liquor of a *bright amber colour*.

Where note that instead of Spirit of Urine you may use oyl of Tartar, or a strong solution of pot ashes.

XXI. Infusion of Logwood in fair water (mixt with spirit of *Sal Armoniack*) straight turns into a deep, rich, lovely purple; two or three drops to a spoonful is enough, lest the colour be so deep, as to be opacous.

XXII. Spirit of *Sal Armoniack* will turn syrup of Violets to a Lovely green.

XXIII. Infusion of *Litmos* in fair water, gives in a clear glass a purple colour: but by addition of Spirit of Salt, it will be wholly changed into a glorious yellow.

XXIV. The Infusions and juyces of several plants, will be much altered by a solution of Lead in spirit of Vinegar.

it will turn infusion of red rose leaves into a sad green.

XXV. So Tincture of red roses in fair water, would be turned into a thick green, with the solution of *Minium* in spirit of vinegar; and then with the addition of oyl of Vitriol the resolved Lead would precipitate white, leaving the liquor of a clear, high red colour again.

XXVI. We have not yet found, that to exhibit strong variety of Colours, there need be imployed any more than these five, White, Black; Red, Blew, Yellow: for these being variously compounded and decomposed exhibit a variety and number of Colours; such as those who are strangers to painting can hardly imagine.

XXVII. So Black and White variously mixed, make a vast company of light and deep grays: Blew and Yellow, many Greens: Red and Yellow, Orange-tawnies: Red and White, Carnations: Red and Blew, Purples, &c. producing many colours for which we want names.

Q 3

XXVIII. A-

XXVIII. Acid salts destroy a blew Colour: Sulphurous, Urinous, or fixed restore it.

XXIX. Acid and *Alcalizate* salts, with many bodies that abound with *Sulphureous* or oylly parts will produce a red, as is manifest in the Tincture of Sulphur, made with *Lixiviums* of Calcin'd Tartar or pot ashes.

XXX. Lastly, It may be worth tryal (since it hath succeeded in some experiments) so to take away the colour of a Liquor, as that it may be colourless: which in what we have tryed, was thus: first by putting into the Tincture, Liquor, or juyce, a quantity of the solution of pot ashes or oyl of tartar *per deliquium*; and then affusing a good or strong solution of Alom, which in our observations precipitated the tinging matter, or gathered it into one body (like as it were curds) and so left the Liquor transparent and clear as Crystal.



## C H A P. XXII

General Experimental observations of  
Mineral Colours.

**S**ublimat dissolved in fair water, and mixed with a little spirit of Urine, makes a *milk white* mixture in a moment : which by addition of *Aqua Fortis*, immediately again becomes transparent.

**H.** If *Sublimat* two ounces, and *Tin-glass* one ounce be sublimed together, you will have a sublimat not inferiour to the best *orient Pearls* in the world.

**III.** *Silver* dissolved in *Aqua fortis*, and evaporated to dryness, and fair water poured two or three times thereon, and evaporated, till the *calx* is dry, leaves it of a *Snow whiteness* : which rubbed upon the skin, (wetted with spittle, water or the like) produces a deep *blackness*, not to be obliterated in some days.

*With this, Ivory, hair, and horns may dyed in fair water of a lasting black.*

**IV.** *Coral* dissolved by oyl of Vitriol,

Sulphur, or spirit of Vinegar, and precipitated by oyl of Tartar, yields a *snow whiteness*. The same of crude Lead and Quicksilver dissolved in *Aqua fortis*. So butter of *Antimony* rectified, by bare affusion in much fair water, will (though Unctuous) be precipitated into that *snow white* powder which (being washed from its corrosive salts) is called *Mercurius Vita*: the like of which may be made without the addition of any Mercury at all.

V. *Mercury sublimate* and precipitate yields (with the spirit of Urine, Harts horn, or the like) a *white precipitate*: but with the solution of *Pot ashes*, or other *Lixivate* salts an *Orange tawny*. And if on a filterated solution of *Vitriol*, you put the solution of a *fixed salt*, there will subside a copious substance far from whiteness, which Chymists call the Sulphur of Vitriol.

VI. If Copper two ounces be mixed with Tin one ounce, the reddishness will vanish: and if Arsenick (calcined with Nitre) in a just proportion be mixed

ed

ed with melted Copper, it will be blanch-  
ed both within and without.

VII. Fine powders of blew Bice,  
and yellow Orpiment, slightly mixed,  
gives a good green: and a high yellow  
solution of good Gold in *Aqua Regia*,  
mixed with a due quantity of a deep  
blew solution of crude Copper in strong  
spirit of Urine, produces a *transparent*  
*green*: And so blew and yellow *Amel*  
fused together in the flame of a Lamp,  
being strongly blowed on without ceas-  
ing produces at length a *green colour*.

VIII. An Urinous salt, largely put into  
the dissolution of blew Vitriol in fair wa-  
ter, turn'd the liquor and corpufcles  
(which refided) into a yellowish colour  
like yellow Oker.

IX. *Verdigriese* ground with salt *Ar-*  
*moniack* and the like (digested for a  
while in a dunghil) makes a *glorious blew*.

X. The true glass of *Antimony* ex-  
tracted with acid spirits (with or with-  
out Wine) yields a *red tincture*.

XI. Balsam of Sulphur (of a deep  
red in the glass) shaken about, or dropt on  
paper gives a yellow stain.

XII. If

XII. If Brimstone and *Sal Armoniack* in powder of each five ounces, be mixed with quick-lime in powder six ounces, and distilled in a Retort in sand by degrees; you will have a volatil spirit of Sulphur of excellent redness, though none of the ingredients be so.

So also oyl of *Anniseeds* mixed with oyl of *Vitriol*, gives in a trice a blood red colour, which soon decays.

XIII. Fine silver dissolved in *Aque fortis*, and precipitated with spirit of Salt; upon the first decanting the liquor, the remaining matter will be purely white; but lying uncovered, what is subject to the ambient air will lose its whiteness.

XIV. *Sublimate* dissolved in a quantity of water and filtred, till it is as clear as *Crystal*, mixed (in a Venice glass) with good oyl of *Tartar per deliquium* filtred, (three or four drops to a spoonful) yields an opacous liquor of a deep Orange colour; after which if four or five drops of Oyl of *Vitriol* be dropt in, and the glass straightway be strongly shaken, the

the whole Liquor will (to admiration) be colourless without sediment. And if the filtered solution of sublimed *Sal-armoniack* and *Sublimate* of each alike be mixt with the solution of an *Alcaly*, it will be white.

XV. Spirit of *Sal Armoniack* makes the solution of *Verdigriese* an excellent *Azure*; but it makes the solution of *Sublimate* yield a white precipitate.

XVI. So the solution of filings of Copper in spirit of Urine (made by fermentation) gives a lovely *Azure* colour: which with *oyl of Vitriol* (a few drops to a spoonful) is deprived in a trice of the same, and makes it like *fair water*. And so a solution of *Verdigriese* in *fair water*, mixed with strong *Spirit of Salt*, or dephlegmed *Aqua fortis*, makes the greenness almost totally to disappear.

XVII. Quick-silver mixed with three or four times its weight of good *oyl of Vitriol*, and the *oyl* drawn off in sand, through a glass Retort, leaves a *snow white precipitate*; which by affusion of *fair water*, becomes one of the loveliest  
light

light yellows in the world, and a durable colour.

XVIII. Tin Calcined *per se* by fire, affords a very white calx called *putty*: Lead, a red powder called *Minium*: Copper, a dark or blackish powder: Iron, a dirty yellowish colour, called *Crocus martis*: and Mercury, a red powder.

XIX. Gold dissolved in *Aqua Regia* ennobles the Menstruum with its own Colour: Silver Coyn dissolved in *Aqua fortis* yields a tincture like that of Copper; but *fine Silver* a kind of faint blewishness; Copper dissolved in spirit of Sugar (drawn off in a glass Retort) or in oyl or spirit of Turpentine affords a green tincture; but in *Aqua fortis*, a blew.

XX. Vermilion is made of Mercury and Brimstone sublimed together in a due proportion.

XXI. Glass may have given to it a lovely golden colour with Quicksilver; but it is now coloured yellow generally with Calx of silver: yet shell silver, (such as is used with pen or pencil) mixed

ed with a convenient proportion of powdered glass, in three or four hours fusion, gave a lovely Saferine blew.

XXII. Glass is tinged Green (by the Glass-men) with the *Calx of Venus*: which Calx mixed with an hundred times its weight of fair glass, gave in fusion a blew coloured mass.

XXIII. Putty (which is Tin calcined) as it is white of it self, so it turns the purer sort of glass metal into a white mass, which when opacous enough, serves for *white Amel*.

XXIV. This *White Amel* is as it were the Basis of all those fine Concretes, that Gold-smiths, and several Artificers use, in the curious art of *Enameling*; for this white and fuseable substance, will receive into it self, without spoiling them, the colours of divers other Mineral substances, which like it will endure the fire.

XXV. Glass is also tinged blew with the dark mineral called *Zaffora*; and with *Manganese* or *Magnessia* in a certain proportion, which will tinge glass of a red

red Colour; and also of a Purplish or Murry; and with a greater quantity, into that deep colour which passes for black.

XXVI. Yellow Orpiment sublimed with Sea Salt, yields a white and Crystalline *Arsenick*; which *Arsenick* coloured with pure Nitre being duly added to Copper when 'tis in fusion, gives it a whiteness both within and without.

XXVII. So *Lapis Calaminaris* turns Copper into Brass.

XXVIII. And Zink duly mixed with Copper when 'tis in fusion, gives it the noblest golden colour, that ever was seen in the best gold.

XXIX. Copper dissolved in *Aqua fortis* will imbue several bodies of the colour of the solution.

XXX. Lastly, Gold dissolved in *Aqua regia* will (though not commonly known) dye Horns, Ivorys and other bones of a durable purple colour: And the Crystals of Silver made with *Aqua fortis*, (though they appear white) will presently dye the Skin, Nails, Hair,



Hair, Horn, and Bones, with a Black not to be washed off.

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## C H A P. XXIX.

## Of Metals.

I. **T**O harden Quick-silver.

Cast your Lead separated from its dross into a vessel, and when it begins to cool, thrust in the point of a stick, which take out again, and cast in the Argent Vive, and it will congeal: then beat it in a mortar, and do so often; when it is hard, melt it often, and put it into fair water, doing it so long till it is hard enough, and may be hammered.

## II. To tinge Quick-silver of the colour of gold.

Break it into small pieces (being hardened) which put into a crucible, with the powder of *Cadmia*, *stratum super stratum*, mixed with pomegranate seeds, Turmeric (beaten fine) and Raisins; cover the crucible and lute it well,

well, dry it well; and then set it on a fire for six or seven hours, that it may be red hot; then blow it with bellows till it run, which then let it cool whilst covered with coles, and it will have the colour of gold.

III. *To fix Quick-silver being hardened.*  
This is done with fine powder of Crystal glass, laid with the metal *stratum super stratum* in a crucible covered and luted; heating it all over red hot, and then melting of it.

IV. *To make Quick-silver malleable.*

First harden it by the 1<sup>e</sup>. then break the metal into small pieces, and boil it a quarter of an hour in sharp vinegar: then adde a little Sal Armoniack, and digest all together for ten or twelve days; then boil all together in a luted crucible, till it is red hot, and by degrees crack: lastly, hang the Mercury in a pot with brimstone at bottom to cover it, lute it and set it into the fire, that it may grow hot by degrees, and receive the fume of the Sulphur; do thus for a month

month once a day, and the Mercury will  
run and be hammered,

V. *Another way of tinging Mercury.*

Take purified Mercury one ounce,  
sulphur two ounces, *Aqua fortis* three  
ounces, let them all stand till the water  
grow clear; distil this with its sediment,  
and at bottom of the Limbeck, you shall  
find the Mercury hard, and of an exact  
colour.

VI. *To tinge silver of a golden Co-  
lour.*

Take fine gold, fine silver, good brass,  
and brass or copper calcin'd with Sul-  
phur vive, of each alike, melt them  
down together, and it shall appear to be  
gold of eighteen carats fine.

VII. *Another way to tinge silver.*

Take Quicksilver purged 3 ounces, leaf  
gold 1 ounce, mix them & put them into  
glass retort well luted, put it on the  
fire till it grow hot; then take it off and  
add to it Quicksilver purged two  
ounces, Salt Armoniack one ounce, Sal  
sellebrot half an ounce, Borax two  
drachms, then seal up the glass herme-

tically, and put it into a continual fire for three days; then take it out, let it cool, open the retort, take out the matter, and powder it very fine: of which powder mix one ounce with silver five ounces, and it will ting it into a good gold colour.

*Note, Sal Elzevrot is thus made. Take pure common Salt, Sal Gem, Sal alcaly in powder, of each one ounce, juyce of mints four ounces, spring water four pound, mingle them, and evaporate. And Quick silver is purged by washing it in sharp vinegar three or four times and straining it; or by subliming it which is better.*

**VIII. To bring silver into a calx.**

This is done by amalgamating of it with Quick silver, and then subliming of it; or by dissolving it in *Aqua fortis*, and precipitating it with the solution of salt in fair water, and then washing it with warm water often to free it from the salts; or else by mingling the filings with sublimed Mercury, and in a retort causing the Mercury to ascend, which will leave at bottome the Calx of sil-

ver, fit for Jewels, &c.

**IX. To blanch Silver.**

Take *Sal armoniack*, *Roch alom*, *Alum plimofum*, *Sal gem*, *Argal*, *Roman vitriol*, of each alike; powder and mix them, and dissolve them in fair water, in which boil the silver so long, till you see it wonderful white.

**X. To colour Silver of a Gold Colour.**

Take *Salt-peter* two pound, *Roch Alom* five pound, mingle, and distil them, keeping the water for use. When you use it, melt the Silver, and quench it in the said water.

**XI. To tinge Brass of a Gold colour.**

Dissolve burnt Brass in *Aqua fortis* (made of *Vitriol*, *Salt-peter*, *Alom*, *Verdigreife*, and *Vermilion*) and then reduce it again, and it will be much of a gold colour.

**XII. To make Brass through white.**

Heat Brass red hot, and quench it in water distilled from *Sal Armoniack*, and *Egg-shells* ground together, and it will be very white.

R 2

XIII. The

XIII. *The way to colour Brass white.*

Dissolve a peny weight of Silver in *Aqua fortis*, putting it to the fire in a vessel, till the Silver turn to water; to which add as much powder of white Tartar as may drink up all the water, make it into Balls, with which rub any Brass, and it will be white as silver.

XIV. *To tinge Copper of a gold Colour.*

Take Copper, *Lapis Calaminaris* of each four drachms, Tutty two drachms; heat the Copper red hot twice, quenching it in piss; doing the like by the *Lapis* and Tutty: take of the dissolved Copper half an ounce, adding to it Honey one ounce, boil them till the Honey look black and is dry that it may be powdred, which then beat with the *Lapis* and Tutty, boil them again, till the Copper is melted and it is done.

XV. *Another way to do the same.*

Melt Copper, to which put a little Zink in filings, and the Copper will have a glorious golden colour.

XVI. *To make Copper of a white colour.*

Take

Take Sublimate, Sal Armoniack, of each alike; boil them in Vinegar, in which quench the Copper being made red hot, and it will be like Silver.

**XVII.** *Another way to whiten Copper.*

Take Arsnick calcined with Saltpeter, and Mercury sublimate, which cast upon melted Copper, and it will be white like Silver.

**XVIII.** *To soften Copper.*

Melt burnt Brass with Borax in a Crucible, quench it in Linseed oyl, and then beat it gently on an Anvil; boil it again and quench it in oyl as before; doing thus five or six times, till it is soft enough; and this will neatly unite with Gold, of which you may put in more by half than you can of other Brass.

**XIX.** *To tinge with Iron a Gold colour.*

Lay in a Crucible plates of Iron and Limstone, *stratum super stratum*, cover and Lute it well, and Calcine in a furnace, then take them out and they will be brittle; put them into a pot with a

large mouth, and put in sharp distilled Vinegar, digesting till they wax red over a gentle heat: then decant the Vinegar, and add new, thus doing till all the Iron be dissolved; evaporate the moisture in a glass Retort or *Vesica*, and cast the remaining powder on Silver, or other white metal, and it will look like Gold.

*To make Iron or Silver of a Brass colour.*

Take Flowers of Brass, Vitriol, *Sal armoniack*, of each alike in fine powder; boil it halfe an hour in strong Vinegar, take it from the fire, and put in Iron or Silver, covering the vessel till it be cold, and the metal will be like to Brass, and fit to be gilded; or rub polished Iron with *Aqua fortis* in which filings of Brass is dissolved.

XXI. *To tinge Iron into a Brass colour.*

Melt the Iron in a Crucible casting upon it *Sulphur vive*, then cast it into small rods, and beat it to pieces (for it is very brittle) then in *Aqua fortis* dissolve



solue it, and evaporate the *menstruum*, reducing the powder by a strong fire into a body again, and it will be good Braised Iron.

### XXII. To whiten Iron.

First purge it, by heating it red hot and quenching it in a water made of strong Ly and Vinegar, boiled with Salt and Alom, doing this so often till it is somewhat *whitened*. The fragments of the Iron beat in a mortar till the Salt is quite changed, and no blackness is left in the Liquor of it, and till the Iron is cleansed from its dross: then *Amalgamate* Lead and Quicksilver together, and reduce them into a powder; lay the prepared plates of Iron and this powder *stratum super stratum* in a Crucible, cover it, and Lute it all over very strongly, that the least fume may not come forth, and put it into the fire for a day; at length encrease the fire, so as it may melt the Iron (which will quickly be) and repeat this work till it is white enough: It is whitened also by melting with Lead, the Marchasit or fire-stone

and *Arsnick*. If you mix a little silver (with which it willingly unites) with it, it gives a wonderful whiteness, scarcely ever to be changed any more, by any art whatsoever.

XXIII. *To keep Iron from Rusting.*

Rub it over with Vinegar mixt with Ceruse; or with the marrow of a Hart: if it be rusty, oyl of Tartar *per deliquium* will presently take it away and cleanse it.

XXIV. *To cleanse Brass,*

Take *Aqua fortis* and water of each alike; shake them together, and with a woollen rag dipt therein rub it over: then presently rub it with an oily cloth; lastly with a dry woollen cloth dipt in powder of *Lapis Calaminaris*, and it will be clear and bright as when new.

XXV. *To soften Iron,*

Take *Alom*, *Sal Armoniack*, *Tartar*, of each alike, put them into good Vinegar, and set them on the fire; heat the Iron, and quench it therein: or quench it four or five times in oyl, in which

which melted Lead hath been put six or seven times.

**XXV. To soften Steel to Grave upon.**

This is done with a *Lixivium* of Oak ashes and unslak'd Lime, by casting the Steel into it and letting it remain there fourteen days. Or thus. Take the Gall of an Ox, Man's Urine, Verjuice, and juice of Nettles of each alike, mix them, then quench Steel red hot therein four or five times together, and it will become very soft.

**XXVI. To harden Iron or Steel.**

Quench it six or seven times in Hogs blood mixed with Goose grease, at each time, drying it at the fire before you dip it again, and it will become very hard and not brittle.

**XXVII. To Solder on Iron.**

Set the joynts of Iron as close as you can, lay them in a glowing fire, and take of Venice glass in powder, and the Iron being red hot, cast the powder thereon, and it will Solder of it self.

**XXIX. To**

## XXIX. To Counterfeit Silver.

Take Crystal, Arsnick eight ounces, Tartar six ounces, Salt-peter two ounces, Glass one ounce and an half, Sublimate half an ounce : make them severally into fine powder and mix them : then take three pound of Copper in thin plates which put into a Crucible (with the former powder *stratum super stratum*) to calcine, covering it and luting it strongly ; let it stand in the furnace for about eight or ten hours ; then take it out, and (being cold) break the pot, and take out all the matter, and melt it with a violent fire, casting it into some mold. Then take purged Brasse two pound, of the former Metal one pound ; melt them together casting in, now and then, some of the aforesaid powder, after which add half as much of fine Silver, melting them together, and you have that which is desired : lastly to make it as white as Silver boil it in Tartar.

## XXX. To purge the Brass.

It is cleansed or purged, by casting into

into it when it is melted broken glass, Tartar, Sal Armoniack, and Salt-petre, each of them by turns, by little and little.

**XXXI. To tinge Lead of a Gold colour.**

Take purged Lead one pound, Sal Armoniack in powder one ounce, Salt-petre half an ounce, Sal Elebrot two drachms; put all into a Crucible for two days & it will be thoroughly tinged.

**XXXII. To purge Lead.**

Melt it at the fire, then quench it in the sharpest Vinegar; melt it again and quench it in the juice of Celadine; melt it again and quench it in salt water: then in Vinegar mixed with Sal Armoniack: and lastly melt it, and put it into ashes, and it will be well cleansed.

**XXXIII. To make Lead of a golden colour.**

Put Quicksilver one ounce into a Crucible, set it over the fire till it is hot, then add to it of the best Leaf-gold one ounce, and take it from the fire, and mingle it with purified Lead melted one pound; mingle all well together with an Iron rod, to which put of the filtered solution of Vitriol in fair water

ter one ounce; then let it cool, and it will be of a good colour. Dissolve the Vitriol in its equal weight of water.

**XXXIV.** *To take away the ringing and softness of Tin.*

Melt the Tin, and cast in some Quick-silver, remove it from the fire, and put it into a glass Retort, with a large round belly, and a very long neck, heat it red hot in the fire, till the Mercury sublimes and the Tin remains at bottom; do thus three or four times. The same may be done by calcining of it three or four times, by which means it will sooner be red hot than melt.

**XXXV.** *To take away the softness and creaking noise of Tin.*

This is done by granulating of it often, and then reducing it again, and quenching it often in Vinegar and a Lixivium of Salt of Tartar. The creaking noise is taken away by melting it seven or eight several times and quenching it in Boys Urine, or else oyl of Walnuts.

**XXXVI.** *To take away the deaf sound of Tin.*

This

This is done by dissolving it in *Aq. fortis* over a gentle fire, till the water fly away: doing thus so long till it is all turned to a calx; which mixed with calx of silver, and reduced, performs the work.

**XXXVII.** *To make a kind of Counterfeited Silver of Tin.*

This is done by mingling Silver with Tin melted with Quicksilver, continuing it long in the fire, then being brittle, it is made tough, by keeping it in a gentle fire or under hot Embers (in a Crucible) for about twenty four hours.

**XXXVIII.** *To Solder upon Silver, Brass or Iron.*

Take Silver five penny weight, Brass four penny weight; melt them together for soft Solder, which runs soonest.

Take Silver five penny weight, Copper three penny weight, melt them together for hard Solder.

Beat the Solder thin and lay it over the place to be Soldered, which must be first fitted, and bound together with Wire as occasion requires: then take Borax in powder, and temper it like

pap

pap, and lay it upon the Solder, letting it dry; then cover it with quick coals and blow, and it will run immediately; then take it presently out of the fire, and it is done.

*Note 1.* If a thing is to be Soldred in two places, (which cannot be well done at one time) you must first Solder with the hard Solder, and then with the soft; for if it be first done with the soft, it will unsolder again before the other be soldred.

2. That if you would not have your Solder run about the piece to be Soldred, rub those places over with Chalk.

XXXIX. To make the Silver Tree of the Philosophers.

Take *Aqua fortis* four ounces, fine Silver one ounce, which dissolve in it: then take *Aqua fortis* two ounces, in which dissolve Quicksilver: mix these two Liquors together in a clear glass, with a pint of pure water; stop the glass close, and after a day, you shall see a Tree to grow by little and little, which is wonderful and pleasant to behold.

XL. To



**XL.** *To melt Metals quickly.*

Take a Crucible, and make in it a lay or course of the powder of any metal, then lay upon it a lay of Sulphur, Salt-peter and Saw-dust of each alike mixed together, put a coal of fire to it, and the Metal will immediately be in a mass.

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**CHAP. XXX.**

*Of the Instruments and Materials of Casting.*

I. **H**E that would learn to cast, must be provided of all the chief Tools thereto belonging; which are 1. *A Trough*, 2. *Sand*, 3. *A Flask*, 4. *Skrew*, 5. *Tripoli*, 6. *The Medal or form*, 7. *A Furnace*, 8. *Crucibles*, 9. *A Pipe*. 10. *Tongs*, 11. *Two Oak plates*, 12. *Plegets of woot*, 13. *Oyl and Turpentine*, 14. *A Hares foot*, 15. *Brushes*.

II. *The Trough* is a four-square thing about half a foot deep or something more;

more ; and its use is to hold the Sand.

III. Of sand there is various sorts, the chief are Higate Sand, and Tripoli ; the which to make fit for the work you must order thus.

If it is Higate Sand you must finely sift it ; if Tripoly, you must first beat it fine then sift it through a fine sieve : to either of these fine sands you must put of pure fine Bole (an ounce to nine ounces) well beaten, dissolved in water, and lastly reduced into fine powder ; which powders you must moderately moisten with this Magisterial water, viz. filterated Brine made of decipitated common Salt : or the same, mixed with Glair of Eggs.

IV. The Flask is a pair of Oval Irons, containing only sides to hold the Sand, which must be pressed hard thereinto : and a passage or mouth for the metal to run in at.

V. The Skrew is an Iron Press, between which the flask is put and prest, after that it is filled with Sand, and hath received the form or impression to be cast.

VI. Tri-

VI. *Tripali* is that of which the second sort of Sand is made, which here ought to be calcined and beaten into impalpable powder, to strew over the sandy moulds; first that the sides of the flask may not cleave together when they are full; secondly that the thing cast may have the perfect form and impression, without the least scratch or blemish imaginable.

VII. The *Medal* or form, is that which is to be impressed upon the Sand, whose likeness we would imitate.

VIII. The *Furnace* is that which contains the fire, where the Crucible is put, for the metal to melt in, which is generally melted with Charcoal.

IX. The *Crucibles* are calcining or melting pots (commonly three-square) made so as they may endure the fire all over, in which the metal is to be melted.

X. The *Pipe* is a hollow Reed, or piece of Tin, to blow coals and filth out of the Crucible.

XI. The *Tongs* are a crooked Instrument

ment to take coals out of the Crucible with, as also to stir and repair the fire; and to take the pot out of the furnace when you go to Cast.

XII. The *two Oak plates* are to be smooth, and to be put between the flask and the sides of the skrew, on each side.

XIII. *Pledgets of wool* are to be put between Oak plates and the sand to fill up empty spaces if there be any.

XIV. The *Oyl and Turpentine* is to wet some paper or cotton threads, which must be set on fire, to smoak the Impression or Mould (being dry) that the metal may run the better.

XV. The *Hares foot* is to wipe the hollow places in the Mould, if they should be too much filled with smoak.

XVI. The *Brushes* ought to be two, to wit one with thick bar Wire strings, another with Hogs bristles, wherewith the work (both before and after casting) ought to be rubbed and cleansed.

## CHAP. XXXI.

*The way and Manner of Casting.*

**W**ASH the Medal in Vinegar, in which put some Salt and straw Ashes; and rub it well with the afore-  
said hair brush, then wash it with water, and dry it well.

**II.** Place the female part of the flask upon one of the Oak plates; so that the middle part, *viz.* that which joyned to the other, may lie downwards.

**III.** Then put the cleansed Medal in the flask upon the Oak plate, in a right line to the mouth of the flask: and if there be two, let them be placed so, that there may be a place left in the middle for the melted metal to run in.

**IV.** Then take of the aforesaid earth or sand prepared, (that is, so much moistened with the Magisterial water, that being crushed between the hands or fingers,

it will not stick but like dry flower, and will stand with the print of the hand closed together) and press it on well in the flask upon the Medal with the fleshy part of your fingers or hand; then with a rule strike off all the superfluous sand that sticks about the flask.

V. This done, the plodgets of wool, or a woollen cloth, must be laid upon it, and then the other Oak plate, and then turned up with both hands, the plates being both held close.

VI. Then taking off the upper plate, put upon it, the male part of the flask, which fill with sand in like manner (the Medal being now between) pressing it down as before, and then with a ruler striking away the superfluous sand.

VII. Upon which lay a woollen cloth, and gently lift off the top, or upper part of the flask, so that the medal may be taken forth,

VIII. All things being thus done with a knife (or some such like) cut the passage for the metal, which let be a little dried: then,

**I X.** Either strew over the side of the impression (now taken off) with calcined Tripoli ground impalpable; applying it upon the female flask again; turn the female flask uppermost, which take off, and strew it in like manner, with the calcined Tripoli, and putting them together again, press them so hard, as that the fine Tripoli may receive the most perfect impression of the Medal, which then take out, by separating the sides of the flask, and gently shaking that part which holds it, till it falls out:

**X.** Or with Cotton wet in Oyl and Turpentine and set on fire let the Impression be smoaked; and if any superfluous fume be taken, wipe it off with a flaxen foot.

**X I.** Then joyn the sides of the flask together, putting them with the woollen cloaths between the Oaken plates, which put into the Press, & skrew them a little.

**X II.** Then the Metal being melted, put it into the mould being hot, which it be Silver, or blanch'd Brass, or

Copper, it will run well enough.

XIII. But if it runs not well, you may cast in about the hundred part of Mercury sublimatè, and an eighth part of Antimony; for so it will not only run well, but also be a harder metal.

XIV. Lastly, the Medal being cooled, take it neatly out and keep it.

Where note 1. That so long as the Impression or mould is not spoiled you may still cast more Medals therein; but when it decays, you must perfectly renew the whole work as at first. 2. That you may blanch them with a pure whiteness by the 9<sup>e</sup> 29. of this Book; or thus, if they be of whitened Brass, Take Sal Armoniack one ounce and an half, Salt-peter two ounces and a half, Leaf silver twenty four grains; mix them and evaporate them in a Luted Crucible, having a hole in the cover, till all the moisture is gone; being cold beat all into fine powder; of which take one ounce, Salt, Alom, Tartar, of each one handfull, fair water a sufficient quantity; mix and boil all in a glazed vessel, in which put the Medals boiling them till they are purely



purely white & then rub them with the Tartar in the bottom very well, wash them in fair water and dry them. 3. That if the Medals be of Gold, or of a golden colour, you may heighten it with Verdigrise and Urine.

## CHAP. XXXII.

### Of Glass and Pretious Stones.

**T**O melt Crystal.

Beat Crystal to bits, and put them into an Iron spoon, cover it and hute it well, and heat it in the fire till it is red hot, which quench in oyl of Tartar: this do so often, till they will easily beat to powder in a mortar, which will then easily melt.

This is of use to countersett Jewels with.

**II.** To make a Cement for broken Glasses.

Glair of Eggs mixed with Quicklime will joyn broken pieces of Glass together, and all Earthen pots, so as that

they shall never be broken in the same place again.

Or thus, Take old liquid Varnish, and joyn the pieces with; bind them together and dry them well in the Sun or in an Oven, and they will never unglew again: but put no hot liquor into them then.

Or thus, Take White-lead, Red-lead, Quick-lime, Gum sandrack of each one ounce, mix all with glair of eight Eggs.

Or thus, Take White-lead, bole, liquid Varnish as much as sufficeth.

Or thus, Take White-lead, Lime, glair of Eggs as much as sufficeth.

Or thus, Take fine powder of glass, Quick-lime, Liquid varnish, of each a sufficient quantity.

Or thus, Take Quick-lime powdred, liquid varnish, glair of Eggs, of each alike: grind them upon a stone: this is a strong glew even for stones.

Or thus, Take Calcined flints and eggshells of each alike, and with whites of Eggs and gum tragacanth or dissolution of gum sandrack make glew, this in few days will be as hard as stone.

Or

Or thus, Take Calcined flints two pound,  
Quick-lime four pound, Linseed oyl so much  
as may temper the mixture, this is wonder-  
full strong: but with liquid varnish it  
would be stronger.

Or thus, Take fish glew, and beat it  
thin, then soak it in water till it is like  
past, make rousls thereof which draw out  
thin: when you use it, dissolve it in fair  
water over the fire, letting it seeth a while  
and scumming of it, and whilst it is hot  
use it. This not onely cements glass but Tor-  
toise shell and all other things.

III. To make Glass Green.

Green glass is made of fern ashes, be-  
cause it hath much of an alcaly salt.  
Crystal or Venice Glass is tinged green  
with Ore of Copper; or with the Calx  
of Copper five or six grains to an  
ounce.

IV. To counterfeit a Diamond.

Take a Saphyre of a faint colour put  
into the middle of a crucible in quick  
Lime, and put it into a gentle fire, and  
heat it by degrees till it is red hot, keep  
it so for six or seven hours; let it stand  
in

in the crucible till it is cold, (lest taking it out hot it should break) so will it lose all its colour, and be perfectly like a Diamond, so that no file will touch it: if the colour is not all vanished at the first heating, you must heat it again till it is perfect.

V. *To prepare the Salts for counterfeit Gems.*

The Salts used in making counterfeit Gems, are chiefly two, the first is made of the herb Kali; the second of Tartar; their preparations are according to the usual way (but in Glass vessels.)

VI. *To prepare the matter of which Gems are made.*

The matter is either Crystal or flint that is clear and white: put them into a crucible in a reverberatory heat (the crucible being covered) then take them out and cast them into cold water, so will they crack and easily reduce to powder: of which powder take an equal quantity with Salt of Tartar (or Sal Alkali) to which mixture adde

what Colour you please, which must be either Metalline or Mineral: put them into a very strong Crucible (filling it about half full) cover it close, and melt all in a strong fire till it become like glasse.

Where note, in melting you must put an Iron rod into it, and take up some of it, and if it is free from bubbles, grains, or specks, it is fused enough: if not, you must fuse it till it is free.

*VII. To make a counterfeit Diamond of Crystal.*

Put Crystal in a crucible and set it in a glasse furnace all night, and then bring it to fine powder, mix it with equal parts of Sal Tartari, digest all night in a vehement heat, but yet not to melt, then take them out, and put them into another vessel which will stoutly endure the fire; let them stand melted two days and take out the mass.

*VIII. To make a Calcedon.*

Mingle with the powder of Crystal, a little calcined silver, and let it stand in fusion twenty four hours.

*IX. To*

IX. *To make counterfeit Pearls.*

Mix Calx of Lima and Eggs-shells with leaf silver ground with our best varnish, of which make paste, and having bored them with a hogs bristle, dry them in the Sun, or an Oven.

X. *To Counterfeit a Ruby.*

Take Sal Alcalý four Ounces, Crystal 3 ounces, Scales of Brass half an ounce; leaf gold six grains, mix all, and melt them in a reverberatory.

XI. *To Counterfeit a Carbuncle.*

Mix Crystal with a little red lead, putting it into a furnace for twenty four hours, then take it out, powder and searce it, to which adde a little Calcin'd brass; melt all again, and adde a small quantity of leaf gold, stirring it well three or four hours, and in a day and night it will be done.

XII. *An Artificial Amethyst.*

Take Crystal one pound, Manganese one Drachm, mix and melt them.

*Or thus,* Take Sal Alcalý three ounces, powder of Crystal four ounces, filings of Brass half an ounce, melt all in a strong fire.

XIII. *An*

XIII. *An Artificial Jacynth.*

Put Lead into a strong crucible, and set it into a furnace, let it stand there about six weeks till it is like glass, and it will have the natural colour of a Jacynth not easily to be discerned.

XIV. *An Artificial Chrysolite.*

Mix with melted Crystal a sixth part of Scales of Iron, letting it stand in a vehement fire for three days. Or thus, to the mixture of the Topaze adde a little Copper.

XV. *An Artificial Topaze.*

To Crystal one pound, add *Crocus Martis* two Drachms, Red Lead three ounces, first putting in the Lead, then the *Crocus*.

XVI. *Artificial Corals.*

Take the scrapings of Goats horns, beat them together, and infuse them in a strong *Lixivium* made of *Sal fraxini* for five days: then take it out and mingle it with Cinnaber dissolved in water; set it to a gentle fire that it may grow thick; make it into what form you please, dry, and polish it. Or thus,  
Take

Take Minii one ounce, Vermilion ground fine half an ounce, Quick Lime, and powder of Calcined flints, of each six ounces, a *Lixivium* of Quick Lime and Wine, enough to make it thick: adde a little Salt, then make it into what form you please, and boil it in Linseed oyl.

XVII. *An Artificial Emerald.*

Take Brass (three days) Calcined in powder, which put again into the furnace with oyl and a weaker fire; let it stay there four days, adding double quantity of fine sand or powder of Crystal: after it is something hard, keep it at a more gentle fire for twelve hours, and it will be a lovely, pleasant and glorious green. *Or thus,* Take fine Crystal two ounces and an half, Sal Alkali two ounces: *flos aris* infused in vinegar and strained one ounce, *Sal Tartari* one ounce and an half; mix and hute them into a crucible, and put all into a glass-makers furnace for twenty four hours, and it will be glorious indeed. *Or thus,* Take Crystal ten ounces, Crocus Martis, and



and Brass twice Calcined, of each one pound, mix and melt them, stirring them well with an Iron Rod.

**XVII.** *An Artificial Saphyre.*

To melted Crystal put a little Zapho-  
ra (two Drachms to a pound of Cry-  
stal) then stir it continually from top to  
bottom with an Iron hook, till it is well  
mixed, keep it in the furnace three days  
and it is done: yet when it is well co-  
loured, unless it be presently removed  
from the fire it will lose its tincture a-  
gain.

**XIX.** *To make white Enamel.*

Take Calx of Lead two ounces, Calx  
of Tin four ounces, make it into a body  
with Crystal 12 ounces, role it into round  
balls, & set it on a gentle fire for a night,  
stirring it about with an Iron rod, till it  
is melted, and it is done.

**XX.** *The general preparations and pro-  
portions of Mineral Colours.*

Plates of Copper must be made red hot,  
and then quenched in cold water; of  
which five or six grains mixed with Cry-  
stal and Sal Tartari of each half an  
ounce,

ounce, and melted, will colour a Sea-green. Iron must be made into a crocus in a reverberatory fire; of which eight or ten grains will tinge the said ounce of mixture into a yellow or hyacinth colour. Silver is to be dissolved in *Aqua fortis* and precipitated with oyl of flints, then dulcified with water and dried, of this five or six grains to an ounce gives a mixed colour. Gold must be dissolved in *Aqua Regis*, and precipitated with liquor of flints, then sweetned and dried; of which five or six grains to one ounce gives a glorious Sapherine Colour. Gold melted with *Regulum Martis nitrosus* five or six grains to one ounce, gives an incomparable Rubine colour. *Magnesia* in powder only ten or twelve grains to one ounce, makes an Amethyst Colour. *Granata* in powder only ten or fifteen grains to one ounce, will tinge the mass into a glorious Smaragdine Colour, not unlike to the natural.

XXI. Lastly, Common Copper makes a Sea-green: Copper of Iron a Grass-green: Granats a Smaragdine: Iron Tel-

low

low, or Hyacinth: Silver, White, yellow, green and granat: Gold, a fair Skie colour: Wismut, a common Blew: Magnesia, an Amethyst colour: Copper and Silver, an Amethyst colour: Copper and Iron, a pale Green: Wismut and Magnesia, a Purple colour: Silver and Magnesia, an Opal; and the like.

## CHAP. XXXIII.

*The ways and manner of Gilding.*

I. **T**O lay Gold on any thing.

Take red Lead ground fine, temper it with Linseed oyl: write with it and lay Leaf gold on it, let it dry, then polish it.

II. *To lay Gold on Glass.*

Take Chalk and red Lead of each alike, grind them together, and temper them with Linseed oyl: lay it on, and when it is almost dry, lay leaf gold on it; let it dry, then polish it.

III. *To gild Iron with a Water.*

**T**

**Take**

Take Spring water three pound, Roch Alom three ounces, Roman Vitriol, Orpiment one ounce, Verdigrise twenty four grains, Sal gem three ounces, boil all together, and when it begins to boil, put in Tartar and Bay Salt of each half an ounce; continue the boiling a good while, then take it from the fire, strike the Iron over therewith, drie it against the fire and burnish it.

*IV. To lay Gold on Iron or other Metals.*

Take liquid Varnish one pound, oyl of Linseed and Turpentine, of each one ounce; mix them well together: strike this over any Metal, and afterwards lay on the gold or silver, and when it is dry polish it.

*V. To Gild Silver or Brass with Gold water.*

Take Quicksilver two ounces, put it on the fire in a Crucible, and when it begins to smoak, put into it an Angel of fine Gold; then take it off immediately, for the Gold will be presently dissolved: then if it be too thin, strain a

part

part of the Quicksilver from it, through a piece of Fustian: this done, rub the Gold, and Quicksilver upon Brasse or Silver, and it will cleave unto it, then put the said Brasse or Silver upon quick coals till it begin to smoak, then take it from the fire, and scratch it with a Wire bruse, this do so long till all the Mercury is rubbed as clean off as may be, and the gold appear of a faint yellow: which colour heighten with Sal Armoniack, Bole, and Verdigrise ground together and tempered with water.

*Where note, that before you gild your Metal, you must boil it with Tartar in Beer or water, and then scratch it with a wire Bruse.*

#### VI. To Gild Books.

Take Bole Armoniack four peny-weight, Sugar-candy one peny-weight, mix and grind them with Glair of Eggs; then on a bound Book, (while in the press, after it hath been smeared with glair of Eggs and is dried) smear the said composition, let it dry, then rub it well and polish it: then with fair water wet

the edges of the Book, and suddenly lay on the gold, pressing it down with Cotton gently, this done let it dry, and then polish it exactly with a tooth.

VII. *Another way of Gilding Iron.*

Take water three pound, Alom two ounces, Sal gem three ounces, Vitriol Roman, Orpiment of each one ounce, flos *Aeris* twenty four grains; boil all with Tartar and Salt as at the 3<sup>e</sup>.

VIII. *To make Iron of the colour of Gold.*

Take Linseed oyl three ounces, Tartar two ounces, yolks of Eggs boiled hard and beaten two ounces, Aloes half an ounce, Saffron five grains, Turmerick two grains: boil all in an Earthen vessel, and with the oyl anoint Iron, and it will look like Gold. *If there be not Linseed oyl enough, you may put in more.*

IX. *A Golden liquor to cover Iron, Wood, Glass, or bones with.*

Take a new laid Egg, through a hole at one end take out the white, and fill up the Egg with Quicksilver two parts, Sal Armoniack finely powdred one part;

part ; mix them all together with a Wire or little stick : stop the hole with melted Wax, over which put an half Egg-shell : digest in horse dung for a month, and it will be a fine golden coloured Liquor.

*X. Another of a pure Gold colour.*

Take juice of fresh Saffron, or (for want of it) Saffron ground, the best clear Orpiment of each alike : grind them with Goats gall or gall of a Pike (which is better), digest twenty eight days in horse dung, and it is done.

*XI. To Gild on Wood or Stone.*

Take Bole Armoniack, Oyl Ben, of each a sufficient quantity; beat and grind them together : with this smear the wood or stone, and when it is almost dry, lay on the Leaf-gold, let it dry, then polish it.

*XII. To Gild with Leaf-gold.*

Take Leaves of gold, and grind them with a few drops of honey, to which add a little gum-water, and it will be excellent to write or paint with.

## CHAP. XXXIV.

*Of Paper, Parchment, and Leather.*

I. **T**o make Paper waved like Marble.  
Take divers dyed colours, put them severally in drops upon water, and stir the water lightly: then wet the Paper (being of some thickness) with it, and it will be waved like Marble; dry it in the sun.

II. *To write golden letters on Paper or Parchment.*

This may be done by the 9, 10, and 12 ē 33. of this book: or write with Vermilion ground with gum Armoniack ground with glair of Eggs, and it will be like gold.

III. *To take out blots, or make black Letters vanish, in Paper or Parchment.*

This may be done with Alom water; or with Aqua fortis mixed with common water.

IV. *To make Silver letters in Paper or Parchment.* Take



Take Tin one ounce, Quicksilver two ounces, mix and melt them, and grind them with Gum water.

V. *To write with green Ink.*

Take Verdigrise, Litharge, Quick-silver, of each a sufficient quantity, grind and mingle them with Urine; and it will be a glorious green like an Emerald to write or paint with.

*Or thus,* grind juyce of Rue and Verdigrise with a little Saffron together; and when you would write with it mix it with gum water. *Or thus,* Dissolve Verdigrise in Vinegar, strain it, then grind it with common water and a little honey; dry it; then grind it again with gum water, and it is done.

VI. *To write on Paper or Parchment with blew Ink.*

Grind blew with honey, then temper it with Glair of Eggs or gum water made of Isinglass.

VII. *To Dye Skins blew.*

Take berries of Elder or Dwarf-elder, first boil them, then smear and wash the Skins therewith, and wring them

Take

T 4

forth

forth: then boil the berries as before, in the dissolution of Alom water, and wet the Skins in the same water once or twice, dry them and they will be be very blew.

VIII. *To dye Skins into a Reddish colour.*  
First wash the Skin in water and wring it well: then wet it with the solution of Tartar and Bay salt in fair water, and wring it again: to the former dissolution add Ashes of Crabshells and rub the Skin very well therewith, then wash with common water and wring them out: then wash them with tincture of Madder, in the solution of Tartar, Alom, and the aforesaid Ashes, and after (if not red enough) with the Tincture of Brazil.

IX. *Another way to Dye them Red.*  
Wash the Skins, and lay them in galls for two hours; wring them out, and dip them into a colour made with *Ligustrum*, Alom and Verdigrise in water: Lastly twice dye them with Brazil boiled with lye.

X. *Another way to Dye them Blew.*  
Take

**Of Paper, Parchment, and Leather.** 281

Take the best *Indico* and steep it in Urine a day, then boil it with *Alom* and it will be good. Or, temper the *Indico* with red Wine, and wash the Skins therewith.

**XI. To Dye Skins green.**

Take *Sap green*, *Alom* water, of each a sufficient quantity, mix and boil them a little: If you would have the Colour darker, add a little *Indico*.

**XII. To Dye Skins Yellow.**

Infuse Woold in Vinegar, in which boil a little *Alom*: Or thus, having dyed them Green by the 11. e. dip them in Decoction of *Privet* berries and *Saffron* and *Alom* water.

**XIII. To Dye them of an Orange colour.**

Boil *Fustick* berries in *Alom* water: but for a deep Orange, use *Turmerick* root.

**XIV. A liquor to Gild Skins, Metals, or Glass.**

Take *Linseed Oyl* three pound, boil it in a glazed vessel till it burns a feather being put into it; then put to it  
Pitch,

Pitch, Rozin, dry Varnish of each eight ounces, Aloes Hepatica four ounces, put all in powder into the oyl, and stir them with a stick, the fire being a little encreased: if the Liquor is too clear or bright, you may add an ounce or two more of Aloes Socatrine, and diminish the Varnish, so the Liquor will be darker and more like Gold. Being boiled, take it, and strain it, and keep it in a Glass for use: which use with a pencil.

### CHAP. XXXV.

#### Of Wood, Horns, and Bones.

**T**O Dye Elder, Box, Mulberry-tree, Pear-tree, Nut-tree of the colour of Ebony.

Steep the wood in Alom water three or four days, then boyl it in Common byl, with a little Roman Vitriol and Sulphur.

Where note, the longer you boyl the wood,

*Of Dying Wood, &c.*

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wood, the blacker it will be, but boiling  
makes them brittle.

*II. To make Horns black.*  
Vitriol dissolved in Vinegar and spirit  
of Wine will make Horns black: for the  
Snow white Calc of Silver in fair  
water.

*III. To make Bones white.*  
They are strangely made white by  
boiling with water and Lime, continual-  
ly scumming of it.

*IV. To Dye Bones green.*  
Take white Wine Vinegar a quart,  
filings of Copper, Verdigrise, of each  
three ounces, Rue bruised one handful;  
mix them, and put the Bones therein for  
fifteen days.

*V. To Dye Wood, Horn, or Bones  
Red.*

First boil them in Alom water, then  
put them into tincture of Brazil in A-  
lom water for two or three weeks: or  
into tincture of Brazil in Milk.

*VI. To Dye them Blen.*

Having first boiled them in Alom  
water, then put them into the Dis-  
solution

Solution of Indico in Urine.

VII. To Dye them Green like Emeralds.

Take *Aqua fortis*, and put as much filings of Copper into it, as it will dissolve; then put the Wood, Horns or Bones therein for a night.

VIII. To Dye Bristles and Feathers.

Boil them in Alom water, and after while they are warm, put them into tincture of Saffron, if you would have them yellow: or juyce of Elder berries, if blew: or in tincture of Verdigrise, if green.

## CHAP. XXXVI.

Of Dying Rarm Linnen cloth, and the like.

I. To Dye a sad Brown.

First infuse the matter to be dyed in a strong tincture of Hermodacts: then in a bag put Saffron and ashes, *stratum*

*tum super stratum*, upon which put water two parts mixed with Vinegar one part; Strain the water and vinegar through, hot, fifteen or sixteen times: in this Lixivate tincture of Saffron put what you would dye letting it lie a night, then take it out, and hang it up to dry without wringing, which do in like manner the second and third times.

*II. To Dye a Blew colour.*

Take *Ebulus* berries ripe and well dried, steep them in Vinegar twelve hours, then with your hands rub them, and strain through a linnen cloth, putting thereto some bruised Verditer and Alom.

*Note, if the blew is to be clear, put more Verditer to it.*

*III. Another excellent blew Dye.*

Take Copper scales one ounce, Vinegar three ounces, Salt one drachm; put all into a Copper vessel; and when you would dye, put the said matter into the tincture of Brazil.

*IV. Another excellent blew Dye.*

Take calcined Tartar three pugils,

un-

unslak'd Lime one pugil, make a lixivium, and filtrate it; to twelve or fifteen quarts of the same water put Flanders blew one pound, and mix them well: set it to the fire, till you can scarcely endure your hand in it: then first boil what you would dye in Alom water, then dry it; afterwards dip it in hot Lye twice or thrice; then put it into the Dye.

*V. A good red Dye.*

Take Brazil in powder, fine Vermilion, of each half an ounce, boil them in Rain water, with Alom one drachm, boil in till it is half consumed.

*VI. Another excellent good red Dye.*

Take of the Lixivium of unslak'd Lime one pint, Brazil in powder one ounce, boil to the half; then put to it Alom half an ounce, keep it warm, but not to boil: then dip what you would Dye first in a Lixivium of Red wine Tartar, let it dry; then put it into the Dye.

*VII. Another very good Red.*

Take Rosset with gum Arabick, boil them a quarter of an hour, strain it: then



then first boyl what you would dye, in Alom water two hours; after put it into the Dye.

**VIII. To make a fair russet Dye.**

Take two quarts of water, Brazil one ounce, boil it to a quart; put to it a sufficient quantity of Granie and two drachms of Gum Arabick.

**IX. A good Purple colour.**

Take Myrtle berries two pound, Alom, calcined Brass of each one ounce, water two quarts, mix them in a Brass kettle, and boil half an hour, then strain it.

**X. A yellow Colour.**

Take berries of purging Thorn, gathered about Lammas day, bruise them, adding a little Alom in powder; then keep all in a Brass vessel.

**XI. Another good Yellow.**

Put Alom in powder to the tincture of Saffron in Vinegar.

**XII. A very good green Colour.**

Take Sap green, bruise it, put water to it, then add a little Alom, mix, and infuse for two or three days.

**XIII. To**

unslak'd Lime one pugil, make a lixivium, and filtrate it; to twelve or fifteen quarts of the same water put Flanders blew one pound, and mix them well: set it to the fire, till you can scarcely endure your hand in it: then first boil what you would dye in Alom water, then dry it; afterwards dip it in hot Lye twice or thrice; then put it into the Dye.

*V. A good red Dye.*

Take Brazil in powder, fine Vermilion, of each half an ounce, boil them in Rain water, with Alom one drachm, boil it till it is half consumed.

*VI. Another excellent good red Dye.*

Take of the Lixivium of unslak'd Lime one pint, Brazil in powder one ounce, boil to the half; then put to it Alom half an ounce, keep it warm, but not to boil: then dip what you would Dye first in a Lixivium of Red wine Tartar, let it dry; then put it into the Dye.

*VII. Another very good Red.*

Take Rosset with gum Arabick, boil them a quarter of an hour, strain it: then

then first boyl what you would dye, in Alom water two hours; after put it into the Dye,

**VIII. To make a fair russet Dye.**

Take two quarts of water, Brazil one ounce, boyl it to a quart; put to it a sufficient quantity of Graine and two drachms of Gum Arabick.

**IX. A good Purple colour.**

Take Myrtle berries two pound, Alom, calcined Brasse of each one ounce, water two quarts, mix them in a Brasse kettle, and boyl half an hour, then strain it.

**X. A yellow Colour.**

Take berries of purging Thorn, gathered about Lammas day, bruise them, adding a little Alom in powder; then keep all in a Brasse vessel.

**XI. Another good Yellow.**

Put Alom in powder to the tincture of Saffron in Vinegar.

**XII. A very good green Colour.**

Take Sap green, bruise it, put water to it, then add a little Alom, mix, and infuse for two or three days.

**XIII. To**

XIII. *To take out Spots.*

Wash the spots with oyl of Tartar *per Deliquium*, two or three times and they will vanish, then wash with water. Spirit of Wine to wash with is excellent in this case. If they be Ink spots, juice of Lemmons or Spirit of Salt is incomparable, washing often and drying it: so also Castle Soap and Vinegar.

## CHAP. XXXVII.

*Of the Dying of Stuffs, Cloaths  
and Silks.*

I. *To make a substantial blew Dye.*

Take Woad, one pound, and mix it with four pound of boyling water: Infuse it twenty four hours; then die with it all white colours.

II. *To make a firm black Dye.*

First Wad it with the former Blew: then take of Galls one pound; water sixty pound; Vitriol three pounds: first boil the Galls and water with the Stuff

or

or Cloath, two hours: then put in the Coperas at a Cooler heat for one hour: then take out the Cloath or Stuff and cool it, and put it in for another hour, boiling it: Lastly take it out again, cool it, and put in once more.

*III. To make an Excellent Yellow Dye.*

Take liquor or decoction of Wheat-bran (being very clear) sixty pound: in which dissolve three pound of Alom: then boil the stuff or cloath in it for two hours: after which take Wold two pounds, and boil it till you see the colour good.

*IV. To make a very good Green Dye.*

First dye the Cloth or Stuff Yellow by the 3<sup>d</sup>. then put it into the Blew dye, in the first Section of this Chapter.

*V. To make a pure clear Red dye.*

Take Liquor or Infusion of Wheat-bran (being strained and made very clear) sixty pounds; Alom, two pounds, Tartar one pound; mix and dissolve them, with which boil the Stuff or Cloath for two hours: take it then out, and boil it in fresh Wheat-bran liquor,

sixty pounds ; to which put Madder three pounds ; perfect the Colour at a moderate heat, without boiling.

VI. *To make a very pleasant Purple Dye.*

First dye it Blew, by the first rule of this Chapter : then boil it in the former Red at the fifth rule hereof : Lastly finish it with a decoction of Brazil.

VII. *To dye Crimson in Grain.*

First boil it in the Red at the fifth Rule of this Chapter : then finish it in a strong tincture of Cochinele made in the Wheat-bran Liquor aforesaid.

VIII. *To make a Bow-dye or scarlet colour.*

Take water an hundred pounds ; *Cremor Tartari* and *Aqua fortis* of each half a pound ; parched pease in powder an hundred : boil all together with the stuff for two hours ; this done, take new water an hundred pound weight ; *Cremor Tartari* and *Aqua fortis* of each two ounces, in which boil the Stuff or Cloath for a quarter of an hour ; then put in the Cochinele, and boil all for about

about half an hour, and it is done. Where note that the vessels in which the stuff and liquors are boil'd must be lined with Tin, else the colour will be defective. The same observe in dying of Silks (in each colour) with this caution, that you give them, a much milder heat, and a longer time.

To enumerate all the Great variety of Dyes, or Colours; or offer at an Essay to reduce them to a certain method, as it is a labour needless, so it is as altogether impossible, there being infinite Colours to be produced, for which (as yet) we have no certain, known or real name: And out of what we have already enumerated in this Chapter, the ingenious (if they please) shall find (by little practice and Experience) such great variety to be apparent, that should we express the number though but in a very low or mean degree, we could not but be exposed in censure to an Hyperbole even of the highest: Every of the foregoing colours, will alone or singly, produce a great number of others, the first more deep or high; the Latter, all of them paler,

paler than each other: And according to the variety of colours the matter is of, before it is put into the dye, such new variety also shall you have again when it comes out; not according to what the Colour naturally gives, but another clean contrary to what you (although an Artist) may expect. For if strange colours be dyt into dyes not natural to them, they produce a forced colour of a new texture, such as cannot possibly be preconceived by the mind of man, although long and continued experience might much help in that case. And if such variety may be produced by any one of those single Colours; what number in reason might be (the ultimate of) any two or three or more of them being complicate or compounded? Now if such great numbers or varieties may be produced 1. by any one single colour; 2. by being complicate; how should we (without a certain and determinate limitation by denomination or name) ever order such confused, unknown, various, and determinate species of things, in any pleasant, intelligible method? Since there-



therefore that the matter (as yet) appears not only hard, but also impossible, we shall commend what we have done to the Ingenuity of the Industrious; and desire that Candor or favour from the Experienced, with love to correct our Errors; which act or kindness will not only be a future obligation to the Author, but also enforce Posterity to acknowledge the same.

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FINIS.

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Shop at the Golden Lyon in Little-Britain.*

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**FINIS.**

